Neutrinos at the Main Injector (NuMI) Project

Project No. 98-G-304
Progress Report No. 58
September 1-30, 2003
(G. Bock, A.L. Read - Editors)
(NuMI-966)

I. PROJECT DESCRIPTION

The NuMI Project provides for the construction of an intense, variable energy, beam of neutrinos using the Fermilab Main Injector, as well as large underground neutrino detectors located at Fermilab and Soudan, Minnesota. The purpose of the project is to enable a new generation of long baseline neutrino experiments that can decisively detect and accurately measure neutrino oscillations. Detection of such oscillations would firmly establish a non-zero value of neutrino mass. The neutrino beam will be of sufficient energy that experiments capable of identifying muon neutrino to tau neutrino oscillations are feasible. The scope of the NuMI Project includes the excavation of large underground laboratories to house the neutrino beam system and the MINOS detectors.

II. OVERVIEW OF PROJECT STATUS – G. Bock

This is the final report of the NuMI Project for FY2002. It has been another very successful year. Overall NuMI is now 92% complete, significantly advanced from 71% at the start of the year. Across the entire project we remain on the re-baselined budget and schedule. The Far Detector at Soudan is complete and recording data on atmospheric neutrinos. At Fermilab the outfitting contract is proceeding well and as September ends we are 3 weeks away from an on-time delivery of the Target Area. Installation in the MI continues successfully. Technical component fabrication proceeded on schedule throughout the year. In preparation for physics running after project completion. MI studies resumed and will continue after the shutdown. The Near Detector planes are completely fabricated and are awaiting installation in the MINOS Near Detector hall early in 2004.

One year ago we forecast project completion (CD4) on February 25, 2005. Today we forecast CD4 completion on February 4, 2005. During FY2003 we accomplished over $30M of work on the NuMI project. During this year we drew $1,673K of contingency.

This month progress on the Service Buildings and Outfitting (SBO) contract continues to be good. Over the last months internal NuMI project management assessment forecast up to a few weeks of delay in beneficial occupancy due to various accumulated changes. Beneficial occupancy of the Target Area is now predicted to occur October 20, 2003. The projected date for occupancy of the MINOS area is now January 31, 2004. There were no recordable injuries during this month. Contingency use to date and future anticipated use remain within our plan.

Work on technical components continues according to our plans. Three Level 3 milestones were met this month and an internal review of installation in the MINOS area occurred. Installation work in the accelerator enclosures began on September 8 and will continue throughout the 7 week shutdown. Floor managers for the MI-65 and MINOS areas continued detailed planning for the upcoming installation activities.

In August the Far Detector took atmospheric neutrino data. Assembly of the Near Detector electronics racks continued and the CalDet run proceeded.

More detailed information on the project's progress and status this month follows in the rest of this report.

III. MASTER SCHEDULE AND FUNDING SUMMARY

The NuMI DOE Project Master Schedule is shown in Figure 1.

The DOE baseline milestones are shown in the figure as solid squares. These fixed milestones are defined in the DOE Project Execution Plan and the Baseline Change Proposal approved in December 2001. Shown as diamonds on the same line are the project's baseline projected dates for achieving the milestones. Actual dates of achieving milestones are shown as inverted black triangles.

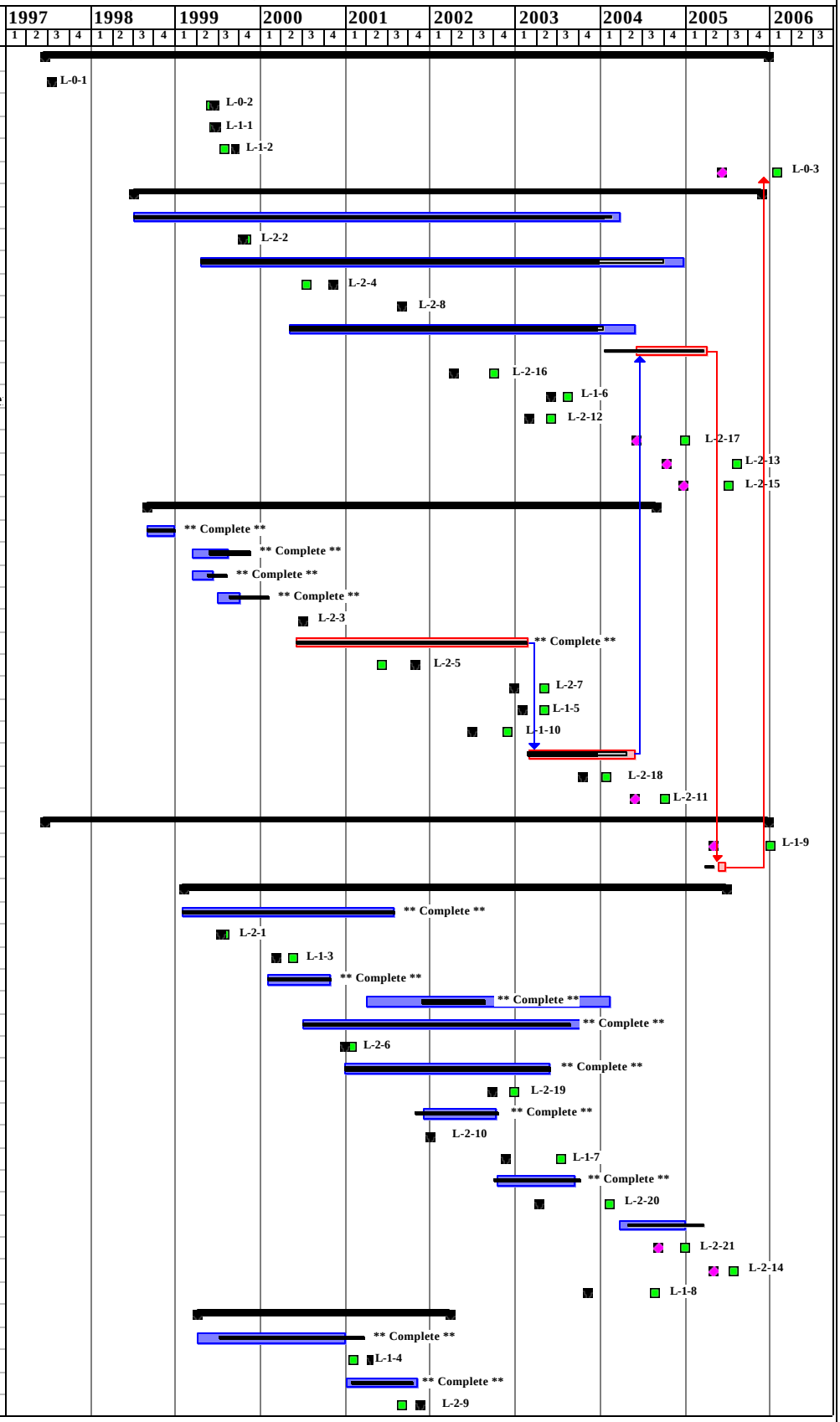
Our actual progress is indicated by black 'thermometer' lines within the horizontal (baseline schedule) bars.

A Table titled "DOE Milestones vs. Current Forecast" follows immediately after the Project Master Schedule. That table lists all the approved Level 0-1-2 DOE milestone dates along with the project's current (and previous month's) forecast for achieving them. The list is sorted by DOE Milestone date. Milestones with forecast dates that have changed significantly in the last month are discussed in Section VIII of this report.

As always the TEC and OPC profiles are presented in the Funding Summary.

10/17/03

NuMI Project
(Fiscal Years)



Project: NuMI_Master_Sched
Date: 10/17/03

Baseline Task
Critical Task
Summary Task
DOE Baseline Milestone
FNAL Current Projection
Milestone Complete
FNAL Forecast
Task Status

DOE Milestone vs Current Forecast
(Sorted by DOE Milestone Date)

10/20/2003

Milestone Description	PEP Milestone #	DOE Milestones (As of 12/2001)	Last Month's Forecast Milestone (8/2003)	Current Month's Forecast Milestone (9/2003)	DOE Milestone Variance (Cal Days)	Monthly Variance (Cal Days)	Notes
CD-1 Approve Mission Need	L-0-1	3/17/1997	3/17/1997	3/17/1997	0	0	Complete
CD-3a Start Limited Construction	L-1-1	2/15/1999	2/23/1999	2/23/1999	(8)	0	Complete
CD-2 Approve Baselines	L-0-2	2/17/1999	2/17/1999	2/17/1999	0	0	Complete
CD-3b Continue Construction	L-1-2	3/31/1999	5/21/1999	5/21/1999	(51)	0	Complete
MINOS Steel Purchase Subcontract Awarded	L-2-1	4/1/1999	3/15/1999	3/15/1999	17	0	Complete
Top of Soudan #8 Mineshaft Located with GPS	L-2-2	6/28/1999	6/16/1999	6/16/1999	12	0	Complete
Far Detector Prototype Erected	L-1-3	1/17/2000	11/10/1999	11/10/1999	68	0	Complete
NTP Issued for Fermilab Underground Subcontract	L-2-3	3/6/2000	3/6/2000	3/6/2000	0	0	Complete
High Current Pulse into Prototype Horn	L-2-4	3/14/2000	7/14/2000	7/14/2000	(122)	0	Complete
CalTech Factory Commissioned	L-2-6	9/29/2000	9/1/2000	9/1/2000	28	0	Complete
Far Detector Excavation Complete	L-1-4	10/2/2000	12/22/2000	12/22/2000	(81)	0	Complete
Fermilab Underground Construction 50% Complete	L-2-5	2/6/2001	6/29/2001	6/29/2001	(143)	0	Complete
Magnets for MI Stub Refurbished	L-2-8	4/30/2001	4/30/2001	4/30/2001	0	0	Complete
Outfitting of Far Detector Enclosure Complete	L-2-9	4/30/2001	7/19/2001	7/19/2001	(80)	0	Complete
Cosmic Rays Observed in Far Detector	L-2-10	3/22/2002	8/31/2001	8/31/2001	203	0	Complete
Technology Choice Made for Muon Monitors	L-2-16	5/30/2002	12/10/2001	12/10/2001	171	0	Complete
Service Building & Outfitting Bid Package Out	L-1-10	7/30/2002	2/25/2002	2/25/2002	155	0	Complete
75% Scintillator Produced	L-2-19	8/30/2002	5/24/2002	5/24/2002	98	0	Complete
Near Detector Hall Excavation Complete	L-2-7	12/30/2002	8/30/2002	8/30/2002	122	0	Complete
Target Hall Excavation Complete	L-1-5	12/30/2002	10/4/2002	10/4/2002	87	0	Complete
Lambertson & C-Magnets Assembled & Tested	L-2-12	2/1/2003	10/31/2002	10/31/2002	93	0	Complete
First Far Detector Super Mod Complete & Tested	L-1-7	3/15/2003	7/24/2002	7/24/2002	234	0	Complete
Inner & Outer Conductors for First Production Horn Assembled	L-1-6	4/14/2003	2/5/2003	2/5/2003	68	0	Complete
Target Service Building Shell Complete	L-2-18	9/30/2003	6/17/2003	6/17/2003	105	0	Complete
Near Plane Pre-assembly Complete	L-2-20	10/10/2003	12/17/2002	12/17/2002	297	0	Complete
Far Detector Complete & Tested	L-1-8	4/25/2004	7/9/2003	7/9/2003	291	0	Complete
Beneficial Occupancy of Service Buildings at Fermilab	L-2-11	5/31/2004	12/19/2003	1/30/2004	122	(42)	
Start Commissioning with Both Near and Far DAQ	L-2-21	8/30/2004	4/1/2004	5/4/2004	118	(33)	
Complete Installation of Horn Power Supply	L-2-17	9/1/2004	2/6/2004	2/6/2004	208	0	
MI Stub Installation Complete	L-2-15	3/11/2005	8/23/2004	8/23/2004	200	0	
Near Detector Complete & Tested	L-2-14	3/31/2005	11/9/2004	12/28/2004	93	(49)	
First Horn Installed	L-2-13	4/7/2005	6/10/2004	6/15/2004	296	(5)	
Start Commissioning	L-1-9	9/1/2005	12/10/2004	12/28/2004	247	(18)	
CD-4 Start Operations	L-0-3	9/30/2005	1/21/2005	2/4/2005	238	(14)	End of Commissioning

IV. FUNDING SUMMARY (K$)

Funding Summary (as of 09/30/2003), amounts in thousands

YEAR	TEC (NuMI Facility) Appropriations	OPC (MINOS, Soudan) Obligations
		Actual costs through FY02. Plan from Baseline Change Proposal
Prior FY's	0	1,417 actual
FY98	5,500	2,348 actual
FY99	14,300	4,114 actual
FY00	22,000	11,324 actual
FY01	22,949[1]	13,598 actual
FY02	11,400	17,227 actual
FY03	19,842[1,2,3]	7,067 actual
		Future Funding Plan
FY04	12,500[2]	4,605 balance
FY05	751[2,3]	500
TOTALS	**109,242**	**62,200**

Note [1]: FY01 Rescission removed $51K from plant line and $26K from OPC. We planned the restoration of these funds in FY03.

Note [2]: FY03, FY04, and FYY05 plant line funds as recommended for inclusion in the Baseline Change Proposal by the September DOE Review and approved in December 2001. This is the $33.042M in additional funding in the rebaseline proposal from Project Management.

Note [3]: FY03 Rescission removed $251K from plant line. We show the restoration of these funds in FY05.

TEC Funding Appropriated,
Not yet authorized

0 Reflects $251K removed from FY03. See Note 3 above.

Total TEC funding authorized

95,991

TEC Obligations to date, (Not including requisitions in progress)

91,053 57,095 **OPC Obligations to date**

TEC Funding authorized but not obligated

4,938

V. NARRATIVE HIGHLIGHTS

MANAGEMENT HIGHLIGHTS – G. Bock

Change requests (CRs) that impacted contingency are included in this report. CR #243 (WBS1.2) and CR #244 (WBS2.5) draw $279K and $36K respectively to cover normal increases due to change orders on the work by Ragnar Benson, Inc on the outfitting work. CR# 242 (WBS1.1.4) returns $114K to contingency reflecting a re-analysis of the installation planning. CR #245 makes minor adjustments to several L3 milestones. Contingency remaining is adequate and management throughout the project continues to work to keep costs down.

A MINOS collaboration meeting at Fermilab this month was attended by more than 90 collaborators. A report on this meeting is included elsewhere in this report.

The Project continues to report its progress against its own plan, which has a more aggressive schedule than that required by DOE milestones. The Project Support staff has developed a chart that provides the DOE NuMI Project Manager with a progress report against the DOE milestones.

Procurement Highlights – R. Huite

NuMI Tunnels and Halls (NuMI Closeout Team)

The Co-leaders of the NuMI Tunnels & Halls Contract Closeout Team are R. Huite and C. Laughton. The closeout team is responsible for the timely and effective closeout of the S. A. Healy contract. This team is organized with several sub-groups bringing together a variety of as-needed expert help, i.e., a negotiating group, claims and legal strategy expertise, geotechnical experts, cost estimators, auditors, procurement, etc.

Procurement support to the NuMI Tunnels and Halls Closeout Team continued to provide oversight of the subcontract terms and conditions, tracking of invoice/payment, and ensuring compliance with the Fermilab Procurement Policy and Procedures manual, and continues to be provided by the NuMI Procurement Administrator. The NuMI Senior Procurement Coordinator attends the NuMI Project Manager's weekly staff meeting (each Monday); a weekly closeout status meeting (each Monday) with the NuMI Manager (G. Bock); a weekly status meeting with the BSS/Procurement Manager (J. Collins); a weekly meeting (each Tuesday) with the BSS/Procurement Manager, DOE-FAO Procurement Specialist (J. Chapman), and others as necessary. In addition, meetings with Head, BSS as may be necessary.

The NuMI Tunnels and Halls Closeout Team consisting of Fermilab (C. Laughton & R. Huite); W. D. Wightman & Company (T. Wightman); Pinnacle One (R. Helmuth); and Montgomery Watson Harza (S. Heinlein/J. Kovacich) continued to evaluate S. A. Healy claims and correspondence. In addition, other outside professionals are retained as the NuMI Closeout Team may require.

Five of the six recommendations have been received from the Disputes Review Board (DRB):

(1) DRB Recommendation No. 3, August 2, 2002 – Geocompostie Drainage Strips/Shotcrete (FNAL No. 40) (Hearing Date – May 9, 2002), for quantum.

(2) DRB Recommendation No. 1, August 21, 2002 – Enhanced Water Treatment Facilities (FNAL No. 14) (Hearing Date – April 4, 2002), for entitlement.

(3) DRB Recommendation No. 2, November 12, 2002 -- Carrier Tunnel Clay Seam DSC at Station 4+20 (SAH No. 17/FNAL No. 53 (Hearing Date – April 4 & 5, 2002), for quantum.

(4) DRB Recommendation No. 4, November 12, 2002 -- MINOS Shaft Excavation Vertical DSC (SAH No. 32/FNAL No. 20) (Hearing Date – May 9 & 10, 2002 and rebuttal July 9, 2002), for quantum.

(5) DRB Recommendation No. 5, April 29, 2003 -- Safety Stoppages & Constraints (SAH No. 68/FNAL No. 62) (Hearing Date -- November 12 and 13, 2002), for entitlement.

The following DRB recommendation is pending:

(1) Decay Tunnel – Clay Seams and Groundwater/TBM (SAH NO. 69/FNAL No. 63) presented at the 3rd DRB Hearing on September 17, 2002. On September 3, 2003, the DRB Chairman advised that the board members expects to use the September 22-24, 2003 time period to finalize this long overdue recommendation. No firm commitment from the Chairman was provided.

Pursuant to the DRB-MOU, recommendations are due within 30 days after receipt of all applicable documents. Topics for two possible future DRB hearings in October and November 2003 have been tentatively identified. Position papers must be exchanged in time if the hearings are to proceed. On September 24, Fermilab sent a letter to the DRB Chairman requesting DRB hearings (Entitlement) for four S. A. Healy claims at impasse. During the period beginning September 29 through October 10, 2003, Fermilab and S. A. Healy will be meeting to discuss the Fermilab Claim for Actual Damages.

The S. A. Healy's subcontract No. 527522 totals $34,629,667 through Supplemental Agreement No. 16. Total amount invoiced from S. A. Healy to date is $34,480,116 through and including Invoice No. 68. Payment has been made in the amount of $31,621,265.36 and $2,858,850.64 retained.

There are a total of 46 claims/change orders open or unresolved [this does not include sixteen (16) change orders denied]. The parties have exchanged all outstanding claims except for about eight that Healy has "reserved their rights" for later presentation.

The following is a summary total of the numbered correspondence (i.e., letters and field communications/memorandums) that have been entered into the NCMO tracking database:

SAH to NuMI Numbered letters – 1304
NuMI to SAH Numbered Letters – 854

NuMI Surface Buildings and Outfitting

The subcontract was awarded to Ragnar Benson, Inc. (RBI), of Park Ridge, Illinois in the amount of $17,880,000 million. The NuMI SB&O Construction Manager for this subcontract is Elaine McCluskey. The Business Services Section/Senior Procurement Administrator is R. Cibic. The following Supplemental agreements have been issued:

Supplemental Agreement No. 1 – EC-001, Temporary Water Treatment at Minos -- $207,508.92
Supplemental Agreement No. 2 – EC-003, Power Clarifications and back-up Generator -- $19,057.50
Supplemental Agreement No. 3 – EC-002, EC-005, EC-006, & EC-007 -- $99,033.00
Supplemental Agreement No. 4 -- EC-009, EC-010, EC-011, EC-012, EC-013, EC-014, & EC-015 -- $28,813.39
Supplemental Agreement No. 5 – EC-004, EC-008, EC-021, EC-022, EC-025, EC-027, & EC-034 -- $159,477.99
Supplemental Agreement No. 6 – EC-017, EC-018, EC-023, EC-031, & EC-032 -- $122,390.74
Supplemental Agreement No. 7 – EC-019, EC-020, EC-028, EC-033, EC-037, EC-038, EC-040, EC-042, EC-043, EC-044, EC-046, EC-048, EC-049, EC-051, EC-053, EC-054, EC-056 -- $140,304.33
Supplemental Agreement No. 8 – EC-026, EC-020b, EC-065, EC-050, EC-061 -- $380,547.53
Supplemental Agreement No. 9 – EC-030, EC-035, EC-052A, EC-058, EC-059, EC-060, EC-62, EC-63, EC-064, EC-066 EC-067, EC-072, EC-076 -- $56,962.56
Supplemental Agreement No. 10 – EC-036, EC-069A, EC-075, EC-078, EC-079, EC-080, EC-081, EC084 -- $144,211.83

The RBI's subcontract No. 546631 totals $19,236,841.43 through Supplemental Agreement No. 10. Total amount invoiced from RBI to date is $12,488,167.92 through and including Invoice No. 9164, dated 22-Aug-2003. . Payment has been made in the amount of $11,488,914.48 and $999,253.44 retained. The amount retained was reduced from 10 percent to 8 percent based on the subcontract Incentive Program for fieldwork completed satisfactorily.

On June 19, 2003, RBI submitted their formal claim for the victaulic pipe run up the Decay Pipe Walkway pursuant to Exhibit D of the subcontract. Fermilab is in the process of reviewing and developing its strategy.

NTP1 (October 1, 2002) provided for procurement and planning activities to include:

(1) Submission of technical and Subcontract submittals including but not limited to: required schedules, safety and quality control submittals, long-lead item shop drawings, and critical item shop drawing submittals.

(2) Procurement of initial critical and long lead items after coordinate submittals have been approved.

NTP2 (November 22, 2002) authorized commencement of work as required by the terms and conditions of the subcontract. Construction activities continue at both the Minos and Target sites.

The subcontract incorporates two incentive programs:

(1) Percentage of fieldwork completed satisfactorily: if Fermilab finds that satisfactory progress is being achieved in the field, Fermilab may reduce the percentage retained based on the scheduled contain in the subcontract. This retention rate is adjusted by increments of 2 percent based on fieldwork percentage completed satisfactory.

(2) Safety performance record: in rewarding the subcontractor for accomplishing the work described within the subcontract without injuries, lost workdays, and/or fatalities within the contractual requirements of the subcontract, Fermilab will reward the subcontractor for fieldwork accomplished over four periods established with the subcontract. The first safety performance period was not achieved due to a missed milestone date and one recordable lost-time accident. RBI and their workforce successfully completed the second safety performance incentive period.

The following is a summary total of the numbered correspondence (i.e., letters and field communications/memorandums) that have been entered into the SB&O tracking database:
SBO to RBI – 315
RBI to SBO – 104
Field Memos (FM) – 0
Field Communications (FC) – 2
NCMO General – 81

NuMI Technical Components

The NuMI Management staff responsible for technical components and the Procurement Coordinator continued to work closely to monitor NuMI requisitions pending award(s) and status of purchase orders. The Procurement Coordinator is available to assist the NuMI Project in the implementation of a tracking system as necessary.

NuMI FACILITY AT FERMILAB
TECHNICAL COMPONENTS (WBS 1.1) – B. Baller, N. Grossman

Overview

Three Level 3 milestones were met this month. The design and drawings for the transmission line were completed (L-3-170). Testing of production horn 1 was successfully completed on the MI-8 test stand (L-3-197). Assembly of the horn 1 module was completed (L-3-194).

A review of the downstream area installation was held on September 18. The MINOS area Floor Manager presented the installation plan to NuMI project managers, a subset of the Director's NuMI Installation review committee, and the MINOS collaboration. This was a companion review to the MI-65 installation review held in August.

Integration and Installation – R. Andrews

General Remarks

During the first week of September, the final preparation steps for the seven/ten week shutdown were completed. The beginning of this shutdown found the usual end effect problems, but these were handled expeditiously. The work is proceeding smoothly, but requires the constant presence of the technical staff of engineers and coordinators to keep the project moving on schedule with safe work practices as the priority.

Weekly planning meetings for the MI-65 region, which also serve to summarize the preparation activities of the previous week, continue. Among the topics being addressed are usage of the staging areas around the building, access requirements, the usage of the crane and shaft, the magnet installation in the Pre-Target area, the unique techniques for delivering special items down the shaft, and the completion of those tasks which interface with the Absorber Hall (while it is still in a construction state.)

The "Installation Readiness Review" for the MINOS Shaft Region was held during the MINOS Collaboration Meeting. Several useful comments were received and are being addressed by the Task Manager and the Floor Manager for the MINOS region.

Main Injector

The Installation Shutdown of '03 began on 8 September 2003. The following activities have been initiated and are either in progress or completed:
Removal of the 30' concrete plug between MI enclosure and the NuMI Stub.
Installation of the magnet hangers in the Main Injector (for the extraction magnets.)
Installation of the LCW piping between the stub and the MI enclosure.
Installation of the Monorail in the NuMI Stub.
Magnet Installation in the NuMI Stub
Lambertson and C-magnet stand and magnet installation.
Extraction channel magnet installation
Magnet cable termination and connection continues.

The work proceeds on schedule, with one task (extraction channel magnet installation) lagging slightly.

MI-65

Most of the installation effort at this time is in the planning and discussion phase. During the month of September, the discussions in the weekly meetings centered around addressing special problems of installation such as:
Installing the Stripline for the horn.
The plan for testing the winch system and installing the magnets in the Pre-target Area.
Sequencing the installation of the capacitor bank that supplies the horn.
Continue development of a detailed work plan consistent with the overall plan in the NuMI Master Schedule.

Plans for the usage of the Shaft Crane are underway and being reviewed by the ES&H Department. In addition to developing the procedure for using the crane, we have been working with the Business Services Section and the T&M Department of Facilities Engineering Services Section to create a plan that will determine who will use the crane for specific activities (i.e., Davis Bacon and Service Contract personnel or Lab Technicians.) Both types of operators are required, and we are working to create a plan that gives us both the flexibility and value that we require.

MINOS

The majority of the effort devoted to the MINOS Installation activity was expended, during the first two weeks of the month, in preparing for the internal review. In addition, some effort has been expended since this review in responding to comments by the reviewers.

Additionally, some time has been spent in developing a plan for crane usage during the period of overlap between the Absorber installation, and the detector installation and assembly. It is required that we address shaft usage when both projects are active.

Primary Beam (WBS 1.1.1) – S. Childress

Overview

Major focus for primary beam efforts during September has been on installation activities in the Main Injector tunnel and NuMI Extraction Enclosure during the extended accelerator system downtime. Good progress is being made in all aspects of the installation.

A very important 1.1.1 effort, installation of the extraction Lambertson magnets, has been advanced by many months from the scheduled July ’04 date, and is to be completed during October in the current shutdown. One 1.1.1 milestone, ‘start construction of profile monitors’, is behind schedule due to prototyping delays.

Magnets and Stands

Installation efforts are going well for both magnet stands and primary beam magnets, both in the MI-60 area of the Main Injector tunnel and the connecting NuMI Extraction Enclosure. As these areas are accessible only during Main Injector shutdowns, these efforts are top current priorities. We are on schedule to complete installation of the full set of 28 major magnets (3 Lambertsons, 1 C-magnet, 12 Quadrupoles and 12 Dipole bending magnets) in October prior to resumption of Main Injector beam.

After magnet installation, tunnel cable hookup is proceeding, and should also complete in this shutdown.

Prototype efforts for NuMI EPB dipole shielding, to provide greatly reduced external magnetic fields for Recycler Ring components, are also in progress.

Kicker Magnet System – C. Jensen

Construction efforts for the 3rd kicker magnet and testing with the prototype load will resume in late October, after resources currently needed for shutdown activities become available.

Preparations have been completed for installation of piping for the Fluorinert cooling system during this shutdown, as a task moved forward from the originally planned 2004 installation schedule. This work will be done in October.

Beam Instrumentation

Vendor fabrication of the VME digital down-converter/digital receiver modules is in progress for the beam position monitor electronics. These modules are very similar to ones built and recently installed for the Recycler BPM electronics, with excellent performance seen.

Installation of the prototype profile monitor into the MiniBooNE primary beam line is scheduled during October, in preparation for beam testing after resumption of accelerator beam.

Beam Permit System – R. Ducar

Operation of new Beam Permit System hardware has continued to operate well. During the shutdown, required C204 modules and Process Channel Interfaces have been installed at both MI-60 and MI-62 service buildings. These installations represent more than half of the required hardware.

Neutrino Beam Devices (WBS 1.1.2) – J. Hylen, D. Ayres, K. Anderson, A. Stefanik

I. Magnetic Focusing Horns

Horn Test Stand. Production Horn 1 was placed on the test stand and run for 380,000 pulses. Tests on Horn 1 were complete before LCW was turned off to MI-8 for the accelerator shutdown on September 16.

Production Horns.

Horn 1. Results of the magnetic field measurements performed in September indicate the horn meets experiment requirements, and no mechanical anomalies were noted during initial lifetime pulse tests. Milestone L-3-197 "Complete Horn 1 Operational Testing in Test Stand" (baseline date of 12/5/03) was completed on September 15.

Horn 2. Horn 2 is ready and waiting for its water tank and module.

Horn Integration. Fabrication of horn 1 water tank is underway, and the tank should be mounted on the horn in October, after which horn 1 will be test fitted to its module.

II. Target

Further target testing is still on hold until October/November. The accord to order a spare target is being drawn up with IHEP.

III. Modules

Horn 1 Module. The milestone L-3-194 "Assembly of Horn 1 Module Complete" (baseline date 10/7/03) was achieved on September 30. All motion mechanisms have been checked for smooth operation throughout the range of motion. Stepper motor operation and calibration will start in October, as well as the installation and integration of position read-backs and limit switches.

Horn 2 Module. Horn 2 module is in the final assembly stage. All parts have undergone successful test fitting prior to nickel coating. It is expected that horn 2 module assembly will be complete around the end of October, well before the milestone date for L-3-216 "Assembly of Horn 2 Module Complete" of 2/26/04.

Target/Baffle Module. Test fitting of parts on the target/baffle module is about to begin. We are on track to meet the milestone date for L-3-235 "Assembly of Target/Baffle Module Complete" of 2/25/04.

Remote Clamp/Stripline block. Work is proceeding for acquisition of two stripline block units. There are a few weeks of vendor delay on the blocks themselves, but they are expected to be delivered in October. The aluminum for the stripline segments through the blocks has been bent to shape, but must still be machined and silver plated, which is estimated to take another 6 weeks. Final assembly is expected to be complete around the end of November. The slow progress on this item has used up a month of schedule float; the first test of plugging the horn into a module with the remote stripline clamp will not happen until December. However, this still provides a few months before scheduled installation to correct any problem found.

IV. Target Carrier and Baffle

We are continuing to receive parts in for the target carrier, and expect to begin assembly in October after completion of horn 2 module assembly.

The baffle graphite has been machined and encased in the aluminum support tubes. All that remains are addition of the cooling fins before the baffles can be shipped from IHEP to FNAL.

V. Target Hall Shielding / Cooling

Air Cooling System. Duratek shielding blocks are stacked at Meson detector building in preparation for prototyping of an air block section. The sheet metal contractor has been out to look at the pile, and will begin work soon.

Steel Shielding. Design modifications to the bottom steel to accommodate the revised air block sheet location are complete. The drawings are being updated for this change.

Concrete Covers. The "R" concrete cover shielding blocks were ordered. Delivery will start early December and be completed by March.

Other Remaining Work. Drawings for the cart hitch are done; material for fabrication was ordered and received. Hitch fabrication is scheduled for early October. The green block lifting tongs are welded and are ready for final assembly and load test. All material for the target pile zero layer has been ordered.

VI. Radioactive component handling

Component-module test stand/positioning system. This test stand is used for assembling horn and target components onto their respective modules and testing hot horn and target handling procedures in MI-8. In September the test stand support was aligned, bolted to the floor and grouted. The lift-table positioning system is in position under the stand but further installation work was stopped by the lack of welders during the accelerator shutdown. The positioning system is mounted on a 3.3 deg ramp to simulate the sloped floor in the Target Hall. This will allow the "z" motion of the positioning system to be fully tested before it is used to attach Horn 1 to its module for the first time. We want to use this stand in October. The milestone date for L-3-212 "Assembly of Horn 1 on Module Complete" is 2/13/04.

Hot cell. The ordering of hot work cell components was nearly completed during September and most components have now been delivered. The pre-assembly of the hot cell structure in the New Muon Lab began during the month with the stacking of the two 14-ft high concrete shield-block walls, including the steel framework for the East-wall viewing apertures. An internal unistrut framework was developed to align shield blocks during stacking, which will speed up underground installation significantly. The sizes of cracks between shield blocks are consistent with expectations. The largest cracks will be filled with shims and grout during the installation underground. The trial assembly will speed up the final installation process by developing rigging procedures in advance, by ensuring that all components fit together correctly and by allowing many of the mounting holes in the concrete blocks to be drilled in advance.

Cameras. No work on the camera system for remote handling has been done since the physicist involved retired. The current plan is to work on this system in the fall, after the horn and target testing programs are completed.

Remaining Design. Design of an installation transport support for the work cell door has been worked out, but drafting has not been done.

VII. Instrumentation/Electronics

The PLC that will be used to control the re-circulating air system was received. The beam-loss-monitor ionization chambers needed for the cross hair alignment system were acquired.

Test stand measurements of the Horn 1 lower magnetic field monitor coils showed the same anomalous behavior as the Horn 2 lower coils. The symptoms are again consistent with leakage currents in the water that collects around the feed-through fixtures of the two lower coils. A modification to drain accumulated water from the lower feed-throughs will be implemented.

VIII. Installation Plan

The installation team has a fully developed plan for the first eight weeks of installation, refining the plan in the NuMI master schedule. Refined plans for the remainder of the installation will be developed during October.

IX. Administrative/Project Management

Milestones for the next six months are called out in the above text. Critical tasks are proceeding on schedule, as indicated by the completion of two milestones this month ahead of schedule. We are on track, but free slack between completing the technical components and their installation-early dates is small, so that we must remain very focused and active in our attempts to prevent slippage.

Physicist, engineering, drafting, and installation team resources are at reasonable levels. A technically driven schedule would call for us to increase our technician force during October and November, which happens to coincide precisely with the period when most technicians will be busy with the accelerator shutdown. We will instead maintain our current technician level, which we believe will still allow us to meet our milestones.

Power Supply Systems (WBS 1.1.3) – G. Krafczyk

Overview (G. Krafczyk)

Milestone L-3-170, "Transmission Line Design & Drawings Complete" was completed in September. The milestone baseline date was 8/15/03. The milestone L-3-195, "Kicker Power Supply Construction Complete" has been moved to 1/15/04 due to shutdown manpower constraints and projected holiday conflicts, again manpower related. This delay should still allow enough time for testing of the power supply after it is constructed. All work for the September shutdown is underway and on schedule. This work is mainly cabling work for the power supplies.

Horn Power Supply (K. Bourkland)

No effort was expended for the NuMI horn power supply in September. Since the completion of tests of horn 2, it was removed from the test stand, leaving us with no load. Since the shutdown started we have no cooling water in MI-8.

The BBC (British Broadcasting Company) will be doing some video taping scheduled for Oct 8th and Jim Hylen is scheduling the installation of a horn on the stand in order to make the system operable and has asked that we do nothing to the system so that we are assured that it should come back on without a hitch.

We will be changing out the voltage dividers and reducing the length that the water pipes extend above the enclosure when the above activity is behind us.

Hooking into the MI clock for a synchronous trigger will involve assistance from the controls group, all very busy with the shutdown.

Transmission Lines (B. Boettinger)

Parts for assembling the Stripline/Shielding Block/Remote Clamp are starting to arrive.

The following items are here or partially here:

1. Machined parts for the remote clamp
2. Ceramics for stripline/remote clamp
3. Shielding blocks
4. Wedge clamps
5. Assembly stand for stripline shielding block

The only item that will hold up the show is the stripline that will arrive in about 6-8 weeks. Some of the assembling (like the remote clamps) can start now.

There are really no design/drafting issues at this time.

There are no issues with the MI-8 testing set-up.

Transmission Lines (D. Tinsley)

The remote clamp parts have been received and the assembly process has begun. Most of the stripline shielding blocks have arrived at MI-8. The Shield Block Support weldment has not arrived yet. It had a promised date of 17-SEP-03. The Shielding Block Stripline has a promised date of 30-SEP-03. It should be delivered to MI-8 soon. Work continues on checking & fixing the transmission line drawings and sending them out for bid. Our priority is shifting over to getting the transmission lines and shielding blocks assembled at MI-8.

Extraction Kicker Power Supply (C. Jensen)

The G-10 coil form should be shipped soon. The PFN oil tank, charging power supply and other small parts were received.

The breaker box for the charging power supply still needs to be built. There are still drafting and wiring drawings to complete and controls cabling to be done.

Only small progress has been made in assembly of the PFN oil tank as shutdown effort has taken all the manpower. The final machine shop work will also have to wait until the end of the shutdown. The G-10 coil form will be wound and brazed at the village machine shop.

Conventional Power Supplies (S. Hays)

Shutdown work continues. Testing of the HV101 loop will follow.

Power supply tests have started with the 3Q120 magnet. This work should result in a supply that meets the operational requirements for higher current loads.

Decay Region & Hadron Absorber (WBS 1.1.4) – C. James

A revised Installation Plan for all the downstream areas, including the Absorber, was presented for internal review at the start of the MINOS Collaboration meeting. The plan calls for the Absorber and the Detector to be installed simultaneously as all the Task Managers agreed that there was more than adequate shaft crane time to perform both operations. The review generated several useful comments, which are currently being responded to. Overall, the comments are on the details, and not on the overall plan, which was accepted by the reviewers.

The revised absorber installation plan was submitted as a CR at the very end of the month. The details will appear in next month's report, but the absorber schedule has been reduced so that it is completed before the near detector is completed, removing the absorber from the critical path. The CR also closed out the costs on completed tasks, and refined the costs for the installation, resulting in a small amount of dollars being returned to contingency.

A designer/drafter was assigned to the remaining absorber design tasks, and made progress on a revision to the shielding, which creates an installation slot for the downstream Hadron Monitor, with a sliding steel door over the slot to facilitate future access to the Hadron Monitor. The Task Manager is pursuing the task of how to "air seal" the Absorber pile (not air-tight, but to retard leakage of air to match the decay time of air-activation); various materials and techniques are being investigated, and the engineer who worked on air-sealing the Target Pile has been a main source of information.

Neutrino Beam Monitoring (WBS 1.1.5) – D. Harris, S. Kopp

This month we learned a little more about how the 1.1.5 installation schedule can fit within the summer '04 installation period. Schedule constraints are posed by the larger beam absorber and near MINOS detector installations. A new downstream beneficial occupancy date of 1/31/04 was assumed. In our current schedule, the support structure for the hadron monitor will be delivered from UT to FNAL by mid February so that it may be installed during absorber stack-up in early March. Installation of the hadron monitor and muon monitor alcove 1 must await the completion of the absorber, sometime in June or July. It also appears that the installation of the downstream 2 muon alcoves may also have to wait for absorber installation in order to keep the alcoves clear for temporary use by the absorber riggers. The installation and checkout should not require more than one month, so this is not a problem. The final installation schedule should be decided within the next month.

Testing and calibration of the muon monitors continued this month. A total of 15 of the 32 detectors constructed (including 5 spares) are now tested. Two fail tests and require minor (1 day) repair. The spread in relative response between chambers is at the level of 3%, and the precision of this calibration is <1%. A 1% relative calibration is required.

Survey, Alignment & Geodesy (WBS 1.1.6) – W. Smart

Thanks to excellent cooperation from the Fermilab Alignment and Metrology Group, several general NuMI tasks were accomplished this month: Survey marks were measured in the target pit for target pile installation, elevation measured through site risers 1 and 2, and a horizontal

check of the two bumped NuMI survey monuments in the target area agreed to about 1 mm with their original positions. The vertical position of monument 66594 has not been checked yet, and cannot be checked for 66592 (since its elevation reference lug was broken off). After partial lists of the actual proton beam magnets to be installed for NuMI were available, seven were referenced during September. The spinning laser reference instrument (to be used for target pile installation) was received.

Survey tasks for the installation of the NuMI proton beam during the current accelerator shutdown proceeded well. Control densification and beam component layout marks were completed in the MI60 and NuMI stub areas. The as-found positions of 4 MI quads were measured and then these magnets were moved slightly to the new positions required by the installation of the NuMI beam. Initial ("rough") alignment of the 3 Lambertson magnets and 2 additional upstream magnets was done after the NuMI survey engineer obtained the precise required positions from Main Injector personnel. All beam magnets will receive a final alignment check after beam pipe, water, and power connections have been made,

The survey engineer effort for NuMI in September was 4.2 mw, with 3.4 mw used for beam component layout and initial alignment of 5 upstream magnets and survey monument installation and measurement; and 0.6 mw for proton beam magnet referencing.

Beamline Utilities (WBS 1.1.7) –D. Pushka

General

Several activities are presently underway and are the emphasis for WBS 1.1.7. Those activities are: continuing to receive instrumentation and all remaining miscellaneous items needed for each system, including controls, and finishing the piping installation for the upstream LCW system in the NuMI Stub portion of the Main Injector.

As reported in previous months, changes to the sump pump and cooling systems to be installed as part of the SB&O civil construction contract were reviewed. These changes, (known as revision 6) affect the design of the Absorber RAW, Decay Pipe RAW and MINOS LCW systems. Changes shown on Revision 6 do not meet the needs of the MINOS D.S. RAW system. Therefore, changes to the SB&O system have been requested, but not finalized by the SB&O construction office. Until changes to the SB&O provided cooling systems are made to provide water at the correct temperature to the 1.1.7 and 2.5.4 water systems, the revisions to the previously completed engineering notes cannot be revised and sent for peer review. This continues to delay the near term milestone for having the RAW systems sent for peer review.

Ross Doyle (BD/Mechanical) has prepared the purchase requisition for the instrumentation for all systems. Level, temperature, pressure and conductivity sensors have all been requisitioned and orders placed. Many instruments have been delivered and installation has started, but not completed. Little instrumentation was installed in September 2003 because of shutdown activities as Ross is busy with the MI-31 shielding installation.

Paul Kasley of Beams Division Controls Department continues to work seriously at selecting and programming the programmable logic controllers (PLC) used on the NuMI Water systems

and the connection to the ACNET front end. Decisions as to which brand of PLC to use have been made. Material has been ordered. Some material has been received.

A requisition for the time and materials electrician sub-contractor to wire the pump motors to the motor starters has been initiated. Work, however, has not yet occurred.

Upstream LCW System

Work on this system in MI-62, which does not require a shutdown, is postponed until delivery of the instrumentation mentioned above. Upon receipt of the instrumentation, Ross Doyle will supervise installation.

The T&M mechanical contractor, SEA Mechanical, has completed the installation of the LCW piping in the area that the 30 foot long shield wall previously occupied. They have also tied into the piping installed by IPS under the SB&O contract at the downstream end of the NuMI Stub. Visual inspection of the welds completed by SEA show that these welds are less uniform than those installed by the other contractors. Radiographic inspections are being scheduled for October 2003.

Final Horn Raw System

Work to weld the piping for the Horn 1 and Horn 2 skids is completed. The next activity will be to install the instrumentation and motor starters as mentioned above. Piping for this system installed as part of the SB&O contract is complete.

The engineering note for this system was peer reviewed nearly a year ago. However, recent sizing checks for the ejector pumps indicate that the motive water needed to meet the design conditions will be larger than what is available from the installed circulation pumps. This is due to the restrictions now apparent in the module design. More careful analysis is needed to quantify the magnitude of the problem and may result in the need to replace the circulation pumps and associated piping.

Upstream RAW System

Work to weld the piping for the upstream RAW skid is completed. The next activity will be to install the instrumentation and motor starters as mentioned above. Piping for this system installed as part of the SB&O contract is complete.

Downstream RAW System

Piping routing drawings for the piping between the absorber and the absorber RAW skid have been started, but not finished. This drawing, together with a specification, will be used for the installation of this piping post beneficial occupancy.

Meanwhile, a need to generate a cost neutral CR to revise the number of RAW pipes between the absorber shielding and the absorber RAW skid has been identified. This CR will be initiated later.

Flow calculations for the engineering note have been completed for the Absorber RAW and Intermediate Systems but need to be revised to account for the changes due to revision 6 of the SB&O drawings.

Meanwhile, the pumps skids for the absorber RAW and absorber Intermediate systems have been assembled, and all pipe welding completed.

Now that the proposed changes to the SB&O installed sump pump and cooling systems have been adopted, a re-design of the absorber intermediate system and the downstream portion of the decay pipe cooling system is necessary. Pumps will likely need to be changed. Calculations to quantify the changes have not been made because of the un-resolved design issues with the SB&O provided system.

In summary, on the Downstream (Absorber and Decay Pipe) RAW Systems, the mechanical design is well underway although the already purchased equipment may need to be replaced, and the peer review of the engineering notes has been put on hold pending the re-design work necessitated by changes to the cooling systems under the auspices of SB&O revision 6. This is a problem and it puts finishing these skids before beneficial occupancy in jeopardy.

Vacuum Decay Pipe Cooling

Piping routing drawings for the piping between the downstream end of the decay pipe and the downstream and the upstream decay pipe RAW systems were prepared, checked and signed off. This piping is included in the SB&O civil outfitting contract and installation of all decay pipe cooling piping in SB&O has been completed.

The status of the engineering note and equipment for the Vacuum Decay Pipe Cooling system is identical to that of the absorber RAW system. Specifically, major equipment has been sized, ordered, received, and installed. The engineering note had been completed for the pre-revision 6 design, although the peer review has not been started because of the potential for significant system changes needed to accommodate the proposed changes to the SB&O sump and cooling systems (Revision 6).

Meanwhile, the Decay Pipe cooling system skids are assembled and piping has been brazed.

Again, documentation for the decisions regarding the “revision 6” changes to SB&O delays initiating the peer review of this system. As such, progress on this system is being hampered.

Extraction and Primary Beam Vacuum System

Jim Klen (BD/MSD) has been assigned to re-evaluate the vacuum design for the primary beam transport beam pipe and has written an engineering note. The note has yet to be subject to a peer review.

Meanwhile a layout of the vacuum system for the pre-target area (complete with the material take-off lists) has been started by Vic Madjanski (PPD/MD) with guidance from Mayling Wong (PPD/MD) and Jim Klen. A similar drawing for the portion of the beamline in the NuMI stub

was finished by Gary Trotter (PPD/MD) (also with guidance from Jim and Mayling). A similar drawing for the extraction channel remains awaiting attention from Tim Hamerla (BD/MSD).

Most of the long lead-time ion vacuum pumps have been ordered and about half have been received. However, much of the vacuum beam pipe spools, flanges, and clamps have not yet been ordered.

Decay Pipe Vacuum System

The Piping and Instrumentation Diagram is complete, the instrument list generated, and the vacuum pump ordered. The vacuum pump has shipped from the manufacturer, but has not yet arrived.

Layout of the vacuum pump out line in the absorber cavern and labyrinth has been started, but not completed. This drawing, together with a specification, will be used for the installation of this piping post-beneficial occupancy.

Gas Systems

The system manager has been instructed to generate a CR to add the upstream (beamline) gas system back into the scope of the project.

Controls, Interlocks and Cable Installation (WBS 1.1.8) – R. Ducar

September was totally consumed with installation activities during the accelerator shutdown. Work has been relatively efficient though complicated, as expected, by magnet stand and magnet installation in the Main Injector enclosure proper and in the NuMI Stub. The thirty-foot shield wall was successfully removed during the first week of the shutdown. Its removal was followed immediately by installation of monorails and hoists in the NuMI Stub. Ragnar-Benson, the SB&O subcontractor, was allowed to finish work at the very upstream end of the carrier tunnel with minimal impact to on-going installation activities. Installation of conventional cable tray was completed in the stub area, although portions were temporarily removed to facilitate installation of one of the monorails and the Q112 quadrupole magnet. Tray has yet to be installed for the conductors of the V108 circuit.

Several magnets at the extraction Lambertson location were electrically and field checked prior to initiation of vacuum installation. This work will proceed as magnets are installed. 480 VAC service was provided to the monorail hoist motor disconnect. Several interferences were cleared in the vicinity of Q106.

Assistance was given to the SB&O Construction Management Office for activities relating to bringing permanent electrical power to the MI-65 site. 13.8 kV electrical feeders were connected to the Main Injector power loop. During this time, the MI-8 service building was powered from an emergency generator. Connecting and disconnecting emergency power was efficient and uneventful. Ragnar-Benson continues to make progress in the installation of technical cables in the MI-65 shaft, Pre-Target, and downstream Carrier Tunnel areas. Presently, all of the magnet power cables have been installed, including the fourteen 500 MCM cables for the V118 circuit. Ragnar's electrical subcontractor has now all necessary technical cables that they are to install.

September was a busy month for cable pulls. The most difficult installation was from the Radiation Safety System "Vault" below the Main Control Room in the Cross-Gallery to the MI-8 service building. Permission was received from Ragnar-Benson through the SB&O CMO to execute a pull of infrastructure cables from MI-8, MI-12 and MI-62 into MI-65. Normally, this would be done after beneficial occupancy. This early installation will facilitate connection of fire protection systems to FIRUS as well as the removal of temporary telephone connections.

Milestones for 1.1.8 have been reviewed with a resulting assessment that completion dates are reasonable.

CIVIL CONSTRUCTION AT FERMILAB (WBS 1.2) – D. Bogert

Overview

During September Ragnar Benson continued work in the two areas, MINOS and MI-65 (target), of the Service Buildings and Outfitting contract. At the end of September, the contract was approximately 82% complete, including work added to the contract by supplemental agreement. There were no recordable safety incidents during the month of September. During September Ragnar Benson concentrated on tasks associated with the completion of the Target Area (the MI-65 Service Building and the underground facility from the end of the carrier tunnel to the downstream end of the Target Hall.) After discussion and negotiation, some days were added by agreement to both Milestone 7, the delivery of the Target Area, and to the completion of the contract. Specifically, Milestone 7 was extended to October 20th 2003 and the MINOS occupancy was extended 43 calendar days to January 31st 2004. These extensions reflect the time impact of scope additions to the contract. Some of these days were added in signed Supplemental Agreements, and some will be added by agreement in Supplemental Agreements not yet signed. Ragnar Benson and their electrical subcontractor also agreed that it would only be possible to make the milestones by the new dates with the addition of significant effort. During the month of September the regular workweek of the electrical subcontractor was extended to 60 hours with the agreement of the workforce, and at the end of the month a second shift was also added. The additional effort during September at the Target Area reduced the associated schedule variance at the Target Area by $400K, but reflecting a "zero-sum game" (effort was redirected from MINOS to Target) the associated schedule variance at the MINOS Area increased by $400K. The total schedule variance remained at nearly $2000K, of which about $350K was at Target and $1600K at MINOS, at the end of September. The extension of the MINOS occupancy to January 31, 2004 will reduce the schedule variance at MINOS by about $1050K, but it will still be necessary for Ragnar Benson and subcontractors to either increase effort or work multiple shifts (or both) to remove the remaining schedule variance at MINOS and complete the work by January 31st. Ragnar Benson has said this will be done, and NuMI Project Management expects the Target Area to be delivered October 20th and the MINOS Area on January 31.

The Fermilab Accelerator Shutdown began in September, and several tasks that had awaited the shutdown were completed. This included the connection to the chilled water system and the extension of 13.8KV feeders to the MI-65 switches and transformers. Other tasks completed at the MI-65 Service building included the placement of the high-bay floor slab, a substantial amount of electrical conduit installation and the commencement of wire pulling, completion of

the piping installation, installation of air-handling systems, controls conduit and equipment installation, painting, and window and door installation. The Target Area roads were paved, and the 10 story emergency egress stairs in the Target Shaft was completed. The Target Area topsoil was final graded and the grass seeded. At the MINOS Service Building more base slab was placed inside portions of the spiral area. Landscaping south of the MINOS access road was completed and the grass seeded. The two MINOS Service Building cranes were installed. Utility installation at the MINOS site was substantially completed. A relatively modest amount of below grade piping and electrical installation was accomplished in the MINOS Area, reflecting the redirection of effort to the Target Area.

Laboratory staff continued to monitor weekly progress using the Ragnar Benson schedule for performance of the contract work. During September the situation improved at Target and deteriorated at MINOS as measured against the approved "original" project schedule that contains 340 work elements. At the end of September, 297 work elements had been started, and 231 of those were completed. Nineteen work elements were not started after their respective "late start" dates and an additional fifty-six elements underway were late with respect to "late finish." This reflects the situation prior to the future rescheduling of the work at MINOS to include the additional 43 calendar days to be added by agreement. A substantial reduction of the number of "late starts" and "late finishes" will be reported in October as a result of the rescheduling. The DOE milestones are not threatened. For the purposes of forecast this month Project Management estimates that the required increased effort (overtime and/or staffing) will continue to be provided and that contract completion (MINOS area) will be on January 31st, the newly extended date, and the delivery of the MI-65 (Target) area will occur October 20th.

The claims and contract closeout issues for the S. A. Healy contract again are discussed at length in the procurement portion of this monthly report. The Disputes Resolution Board did not deliver the sixth and final recommendation to the parties during September. Three-party telephone discussions of this situation between the Disputes Resolution Board, S. A. Healy, and Fermilab did occur in September, and a meeting of all three parties is scheduled in October. Additional discussions between Fermilab and S. A. Healy did not lead to a global resolution of the outstanding issues.

Surface Buildings and Outfitting – E. McCluskey

At the Target Site, RBI installed medium voltage cables from the MI-8 manhole to the MI-65 utility pad and tied in the permanent power for the site. Wire pulling began in many areas of the building. The top of the shaft collar above the shaft stairway was cut down and the slab over the stairway installed. The high-bay concrete floor slab was placed. Painting inside the building recommenced. Desiccant mechanical units were operated. Shaft stair steel installation was completed along with conduits and ductwork in the stair side of the shaft. Cables were installed in the cable trays in the shaft. Fire alarm wiring and devices began to be installed throughout the building. Tie-in to the Fermilab chilled water main was completed when the accelerator shutdown started. Site grading and seeding were completed and the site started to "green-up". The bridge crane was tested. A second shift for the electricians, in addition to regular Saturday shifts, started the last week of the month to aid in completion of the Target area work by the October milestone.

Below-grade at Target, wire pulling continued in all areas. Mechanical controls and ductwork installation was completed in the Target Support Rooms. Conduits and controls installation continued in the Decay Walkway. The 30-ton Target Hall crane was tested. Fire alarm wiring and devices began to be installed. The added platform over the Target Hall ventilation space was installed. Lexan was installed at the Target Hall guardrails. Rock removal continued at the east Target Hall walkway to allow sufficient space for the east handrail and proper exiting in this area.

At the MINOS Site on the surface, underslab utility installation continued. Slab on grade was placed inside the spiral. Interior cmu and ceiling deck installation was completed around and over the elevators. Two building overhead bridge cranes were installed. Mechanical equipment, ductwork, and piping were begun inside the building. Site grading and seeding were completed south of the site road. All site utilities with the exception of some electrical lighting and the holding tank were completed. The CHW and gas were installed into the building. The chiller pad outside the building was placed.

Below-grade at MINOS, GW and LCW piping installation continued on top of the passageway in the MINOS Passageway and Hall and under the Detector Platform. Electricians continued installation of utility supports and conduit at the west side of the MINOS Tunnel and wireway under the Detector Platform. Little additional electrical work was completed in the tunnel due to concentration of forces at the Target site. In the Decay Walkway and Absorber Access Tunnel, the exhaust pipe to EAV-3 installation was completed. Electric heaters were installed in the Absorber Access Tunnel. Sprinkler piping resumed at the base of the shaft. Concrete pads for mechanical equipment were installed at the upstream end of the Absorber Access Tunnel, and pipe rack extended to this location.

The CMO staff and its consultant engineers completed revision 11 to the subcontract documents and issued it to RBI. The CMO reviewed and commented back to RBI on the third schedule revision. The CMO and RBI iterated on the RBI proposal for changes as a result of revision 9 to the subcontract documents. This revision is mostly electrical in scope, and includes drawing inconsistencies, field required changes, changes recommended by the reliability study. Final conclusion of this revision is expected in October, a time extension request is likely.

Change orders to the SBO subcontract were processed. Supplemental Agreement 10 was issued. The total cost changes to the project at the end of September through SA10 were $1,356,841.43, an increase of 7.6% over the original subcontract value. Schedule changes have extended the beneficial occupancy milestone for the Target Site (MS7) by 15 calendar days, the beneficial occupancy milestone for the MINOS Site (MS9) and for project complete (MS10) by 7 calendar days.

The CMO requested proposals from RBI for the following:
Revision 11 modifications;
Additional controls conduits;
Revised process piping in the MINOS Hall to allow for EAV-4 to be used as a sight riser;
Concrete pads in the Absorber Access Tunnel for future mechanical equipment.

A proposal was solicited from RBI and another local subcontractor for removal of sludge leftover near the Target site from the SA Healy water treatment operation. The award was made

to Whittaker Excavating, and will be managed from the SBO CMO office, with the assistance of FESS/Engineering. This work should be completed at the end of November 2003.

Site tours for NuMI project installation and FESS services and operations personnel continued as required.

MINOS DETECTORS (WBS 2.0) – R. Rameika

Overview

In September the Far Detector DAQ timing system was successfully improved to accommodate routine light injection data interspersed with regular data taking. Assembly of Near Detector racks continued at the New Muon Lab and Caldet data taking was in progress.

Some examples of statistics for the production status at the end of the month are given below. (Production items that have been listed as 100% complete in prior months are not shown here.)

WBS	Near Detector Production Items	%Complete
2.2	Near MUX boxes complete and delivered to FNAL	98%
2.3	Near Electronics production MENU boards checked out	92%
2.5	Near Detector Electronics Rack assembly	61%
2.5	Near Detector Planes installed	0%

Electronics and Data Acquisition (WBS 2.3) – G. Pearce, P. Shanahan

Overview

Support for the Near Detector Electronics run of the Calibration Detector at CERN (CALDET) continued throughout most of the month. Production on all Front End Electronics circuit boards is nearing completion, with checkout roughly 50% complete. (The project tracking level for WBS 2.3.1.3 is ahead of this number, since it includes power supplies and other items that have already been checked out). Following the resumption of production in August, the first deliveries of production Front End Crates (MINDER Crate) are expected in October.

Progress on the Data Acquisition system (DAQ) in September included the completion of the Near Detector DAQ at the CALDET. The remote Control Room at Fermilab has been installed at Fermilab, which has allowed several CALDET shifts to be taken by non-DAQ experts at Fermilab. The Far Detector is now taking Light Injection (LI) data for calibration according to the original design of the system, with real-time analysis of LI data taken during physics data-taking.

The Timing System for the Far Detector was upgraded in September. This work included tuning of operational parameters, and general testing and debugging that led to the identification of several minor flaws in the system. Each of these has either been resolved, or is actively being worked on.

An internal review of Near Detector Installation and Commissioning was held during the September collaboration meeting. This was the first opportunity for all collaborators who will be involved in this phase to present plans for their contributions. As a result, the details of the installation and commissioning schedule are being worked out.

Near Detector Front End Electronics (WBS 2.3.1) - G. Drake

Assembly and checkout of the MENU Modules continues. It is believed that the shortage of parts has been resolved, and deliveries from the assembler have resumed. The assembler delivered ~500 MENUs this month, bringing the total to ~10,100, or 98% complete. Approximately 9,400 have been successfully checked out at Fermilab and IIT (~92% of the total.)

The assembly of MASTERs is complete. Testing of MASTERs at Argonne was mostly suspended in September to debug a noise problem observed at CALDET. The problem has been resolved, and checkout will begin again in earnest in October.

The assembly of KEEPERs is complete. Checkout is in progress at Argonne. We have successfully checked out 24 boards to date, or 49% of the total. The checkout process is in a steady state now.

The assembly of MINDERs had been suspended pending replenishing a shortage of parts. We have now delivered the missing parts to the vendor, and the assembly should finish in October. We have received approximately 625 MINDERs from the assembly vendor, approximately 95% of the production quantity. Checkout is in progress at Argonne. We currently have successfully checked out 190 boards, or 30% of the total. The checkout operation is routine now.

The production of MINDER Crates is in progress. First deliveries of the production units are expected in early October.

The fabrication of the Type 2/3 PMT cable sets is complete. The assembly of the Type 1 PMT cable sets is in progress, and is presently 50% complete. The bid package for the fabrication of the Type 4/5 PMT cable sets will go out in early October.

A prototype PIN Diode AUX Card was designed, fabricated, and built at Fermilab. It was tested at Argonne using the Toy Pulser from Sussex. The board tested successfully, and has been sent to CALDET for additional testing and eventual use in data-taking. The assembly of the remaining 7 boards will occur after we receive feedback.

Data Acquisition (WBW 2.3.4) – G. F. Pearce

Installation of the Near Detector DAQ on the Calibration Detector at CERN was completed. The test beam run has been in progress throughout this month and much valuable experience is being gained with the DAQ, as a result of which a number of improvements to the Near system have been made. A considerable investment of DAQ effort is being made in supporting this run.

At the Far Detector (Soudan), the timing system upgrade (see WBS 2.3.6) was assisted by a core DAQ group member, in particular with debugging and with data integrity checks. The second

change worthy of note is that, following hardware tuning of the time delay in one of the pulser boxes, interspersed light injection was enabled as the routine mode of operation (as per system design). The transition to this mode of running has been smooth, with the DAQ successfully handling the additional data source and performing the real time analysis of light injection data.

A MINOS Control Room (CR) has been installed at Fermilab from which formal operational shifts will be run. At first this will be remote operation of the Soudan detector but will extend to include the Near Detector when it is ready. At present this CR has also been connected to the Calibration Detector at CERN and some remote shifts are being taken from the U.S.A. to assist with the 24-7 test beam run. While both the Far Detector and the Calibration Detector have been operated remotely by experts over the last two years, this is the first time it has been done by shift crew from the Fermilab control room and represents a milestone in operations.

A number of improvements have been made and implemented to the Run Control (RC) package during September, including an operator-friendly interface for editing details of the run configuration. A mini-daq-workshop has been planned and will be held in the UK to work on further improving the Far Detector for remote-operations. This will be held on October 13-14 and will focus on RC and RC related issues.

A Near Detector installation review and workshop was held at Fermilab during the September collaboration meeting at which the DAQ plans for installation and commissioning were presented. Discussion of the interaction between the DAQ and other sub-systems during the installation and commissioning phase and the need for close co-operation in the schedule was especially valuable. Purchase of DAQ equipment for the Near Detector is on schedule. All VME processors and PVIC electronics have been purchased and delivered. Cables will be ordered within the next few weeks following confirmation of the lengths required. The PCs have been sourced and a quote received; these will be ordered for delivery in or before December.

Clock and GPS (WBS 2.3.6) – A. Weber

C. Perry, G. Barr and N. Tagg spent two weeks at the Far Detector to implement a round of upgrades to the FD timing system. These upgrades included new firmware which tuned some aspects of the timing system with regards to operational parameters. Monitoring cables were added to the Timing Receiver Cards so that a future software upgrade to the ROP computers could read out monitoring information; this information will be used in future to predict and diagnose problems with the TRCs and the optical linkages.

Several minor flaws were found with the front-end systems which required fixing and will require future attention. In particular, a potential problem has been identified that will cause a maximum absolute timing error of 5 microseconds with respect to the beam arrival time. This flaw is now understood and a fix to the firmware to correct this problem is now being developed. In addition, the back-end of the system was tested to understand the failure modes. In particular, the system was tested to determine how it responded to failures in the GPS, the GPS antenna, and the long-term stability of the system. New documentation, including detector operator guidelines, is now being written with this experience in mind.

Detector Control and Monitoring (WBS 2.3.8) – A. Habig

Software: The DCS SQL DB was optimized this month, to fix performance problems. The West side of the far detector's WEINER power supplies are logging their voltages and currents to a text file via CANbus. The East side will join them soon and data will be put into the DB.

Near Detector: RPS parts are trickling in. All the HV control parts are now in New Muon.

Near Detector Installation (WBS 2.5) - C. James, J. Thron

Lots of work continued in preparing the racks for the Near detector. The effort shifted from the MINDER racks to the Master racks. This was due in part to waiting for the delivery of the Minder heat exchangers (which have now been shipped) and partly to the work the IIT group has done on the Master racks. They have rearranged the power supplies, installed the power supply harnesses, the air flow sensors, the smoke detectors, and the RPS units. On the HV racks the High Voltage supplies, smoke detectors and Ethernet adapter boxes have been installed.

More items have arrived, including: the last of the readout fiber cables; all the pieces needed to assemble the Minder fan packs; all the wiring, fuses, and supports for the Minder power harnesses; and more RPS units.

During this month there was a MINOS collaboration meeting where there was a Near Downstream Installation review and a Near Installation Working Group session. At the former there were reports from the installation task managers and floor managers describing the installation plans, procedures, and time and effort estimates. At the latter there were reports from the collaborators describing their part of getting the detector working - the cabling, checkout, surveying, etc. All this information is being compiled in an MS Project file to be able to coordinate and track these tasks.

September 2003 MINOS Collaboration Meeting – D. Ayres

This meeting was held at Fermilab on Thursday through Sunday, September 18-21. More than 90 physicists, engineers and students from 26 institutions attended. The main meeting plenary sessions on Friday, Saturday and Sunday were preceded by working group meetings on Thursday. Attendance was lower than usual because the CalDet run at CERN was in progress during this meeting. On Friday a collaboration photograph was taken with the MINOS Service Building in the background and on Sunday there was a tour of the NuMI beamline underground construction site.

The following working groups and committees met on Thursday: Core software, Far detector operation technical issues, Near detector installation and commissioning, NuMI Project review of near detector and absorber installation, Proton intensity, and Reconstruction software. The MINOS Executive Committee and Institutional Board both met in conjunction with this meeting.

The most important topics discussed at this meeting were:

1. Updates from the physics analysis working groups.

a. The analyses of atmospheric neutrino and cosmic ray muon data from the far detector continue to make steady progress. Improved techniques are providing better background rejection for both contained and upward-going muon events. The group is studying the feasibility of using the far detector's fast timing to identify K+ tracks, as was done in the K2K l kton detector. This would measure an important background for proton decay experiments and enable a search for double nucleon decay in MINOS.
b. The nu_e analysis group continues to improve techniques for separating nu_e from nu_mu CC and NC events. The group has also been studying the implications of new information from SNO and Super-K on the sensitivity of searches for nu_mu to nu_e oscillations.
c. The NC analysis group's effort to separate NC from CC events is being carried out jointly with the nu_e group. The NC group is continuing its search for trigger algorithms with improved sensitivity and has also begun a study of techniques to isolate a sterile neutrino signal.
d. The CC analysis group is updating its sensitivity calculations to reflect the lower Delta m^2 range from Super-K. The group has also begun detailed studies of systematic errors and is examining ways to implement a blind analysis.
e. The Beam Systematics and Near Detector analysis groups continue to refine simulations of the NuMI beam and the detector. An improved secondary particle production model has shown that the high-energy tail of the low energy beam will be lower than originally estimated. The near detector group is continuing its study of a possible fine-grained scintillator detector upstream of the MINOS near detector and has also begun a study of information that may be gained from operation with reduced horn currents.

2. Plans for the MINOS mock data challenge.
The collaboration has decided to generate a simulated NuMI beam data set to test analysis techniques and software before the neutrino beam turns on. The scope and parameters of this mock data challenge were discussed in detail for the first time at this meeting. The minimum goal of the exercise is to perform a basic readiness check of software that extrapolates near detector data to predict far detector spectra. A more ambitious goal would be to generate data sets containing physics, calibrations and systematic effects that could be analyzed to produce publication-quality results. Specifications for the mock data set will be developed in time for the January collaboration meeting.

3. Preparations for the December PAC meeting.
Doug Michael will present the collaboration's 5-year plan at the December 12-14 PAC meeting. The material submitted to the June meeting will be updated to include the effects of the new Super-K Delta m^2 result and of our latest beam spectra calculations. Some new results from MINOS analysis groups, for example sensitivity to sterile neutrinos, will strengthen the case for increased proton intensity.

4. Detector operations planning.
The completion of the far detector this summer marks the end of the NuMI Project at Soudan and the beginning of the collaboration's responsibility for detector operation. Fermilab is providing an operations budget for FY 2004 and the collaboration has established the MINOS Operations Board (MOB), chaired by Gina Rameika, to manage the experiment in this new era. The central goal is to maintain excellent data quality and a high duty cycle for the data acquisition (well above 90%). This requires a physicist presence at Soudan, nominally one "expert" and one novice/trainee at all times, and a complete set of documentation for operation, performance evaluation, and repair. The establishment of detector monitoring shifts at remote control rooms

at Fermilab and in the UK, beginning in October, is an important part of the operations plan. In addition, analysis teams will scrutinize far detector data to identify anomalies and malfunctions promptly.

5. Proton intensity.
Alberto Marchionni described the ongoing work to establish multi-batch operation of the Main Injector for MINOS. He highlighted a number of specific critical tasks that would benefit from MINOS collaborator participation. MINOS students and postdocs have already contributed significantly to accelerator upgrades needed to increase proton intensity for MINOS.

6. MINOS Control Room.
The MINOS detector control room on the 12th floor of Wilson Hall is now functional and is being used to monitor the operation of both the far detector and CalDet.

7. MIPP experiment.
The MIPP secondary particle experiment received its first (parasitic) beam just before the September accelerator shutdown. The installation of the experiment and commissioning of the beamline are progressing well. MIPP will measure cross sections needed for the NuMI beam simulation.

8. US neutrino program.
Four Divisions of the APS are organizing a year-long workshop to define a roadmap for neutrino physics in the US. Collaborators were strongly urged to participate.

VI. ES&H HIGHLIGHTS – M. Andrews

Management Overview – M. Andrews

Mike Andrews continued to provide ES&H support to the Service Building & Outfitting Construction Management Offices (NCMO) to augment the civil construction oversight effort. His efforts include reviewing the implementation of the subcontractor's safety program, concurring with the subcontractor on where improvements are needed and the priority for those improvements, attending pre-shift subcontractor safety meetings to verify continuing improvement, and participating in weekly ES&H Inspections with the sub-contractor and representatives from the DOE Fermi Area Office.

The NuMI Project and Ragner Benson project management teams meet on a weekly basis to discuss work planning issues, hazard analysis review, training issues, general ES&H program issues, and day-to-day scheduling issues through a series of regularly scheduled meetings.

Mike is also providing ES&H support for the Installation phase of the project. At present, he chairs a weekly ES&H meeting with NuMI/MINOS Project Management to discuss issues relating to the upcoming installation and operational phases.

NuMI Beam Safety Issues – M. Andrews

The NuMI Project ESH Coordinator (Mike Andrews) and the NuMI ESH/QA Committee Chair (Keith Schuh) meet on a weekly basis to discuss and coordinate the process for completing upcoming equipment reviews by the committee. They also discuss the status and progress of reviews that are in progress.

The committee is presently reviewing Engineering Notes for the MI-62 Heat Exchanger Stand and the NuMI Horn Raw System. The committee has completed and signed off reviews for NuMI Stub Magnet Stands, the NuMI Extraction Aisle Side Support, the B2 Dipole Lifting Fixture PT/CT, the Pre-Target Magnet Transport Cart, the CT Magnet Transport Cart, the Horn 1 Module, the NuMI Extraction Magnet Stand Cradle, NuMI Extraction Magnet Stands Generic Supports, NuMI Extraction Magnet Stands Q105, and NuMI Extraction Magnet Stands Q106.

The project has finalized the NuMI/MINOS underground access procedures and ES&H training requirements. The ESH Project team is presently finalizing the emergency management plans for the installation and operational phases.

Regular weekly meetings continue to occur between the NuMI Project ES&H personnel and the MI-65 and MINOS Floor Managers to coordinate upcoming ES&H requirements, including daily work planning meetings and hazard analyses for installation tasks.

Weekly Installation Meetings continue to occur between NuMI Project ES&H personnel and L2/L3 Managers. The topics discussed include installation procedures, hazard analyses, and equipment ESH/QA reviews.

Construction Safety – M. Andrews

NuMI Project Management, FNAL ES&H Section, and DOE performed multiple ES&H reviews and audits during the month of September. NuMI Project Management developed and distributed a report for ES&H Inspections conducted on September 4th, 11th, 18th, and 25th, 2003. Safety Findings/Deficiencies were transmitted to the Subcontractor through the NuMI Construction Management Office. A follow-up on each finding was conducted during the Weekly ES&H Inspections and in the Weekly Construction Management Meetings with Ragnar Benson Management in order to track and/or close each item.

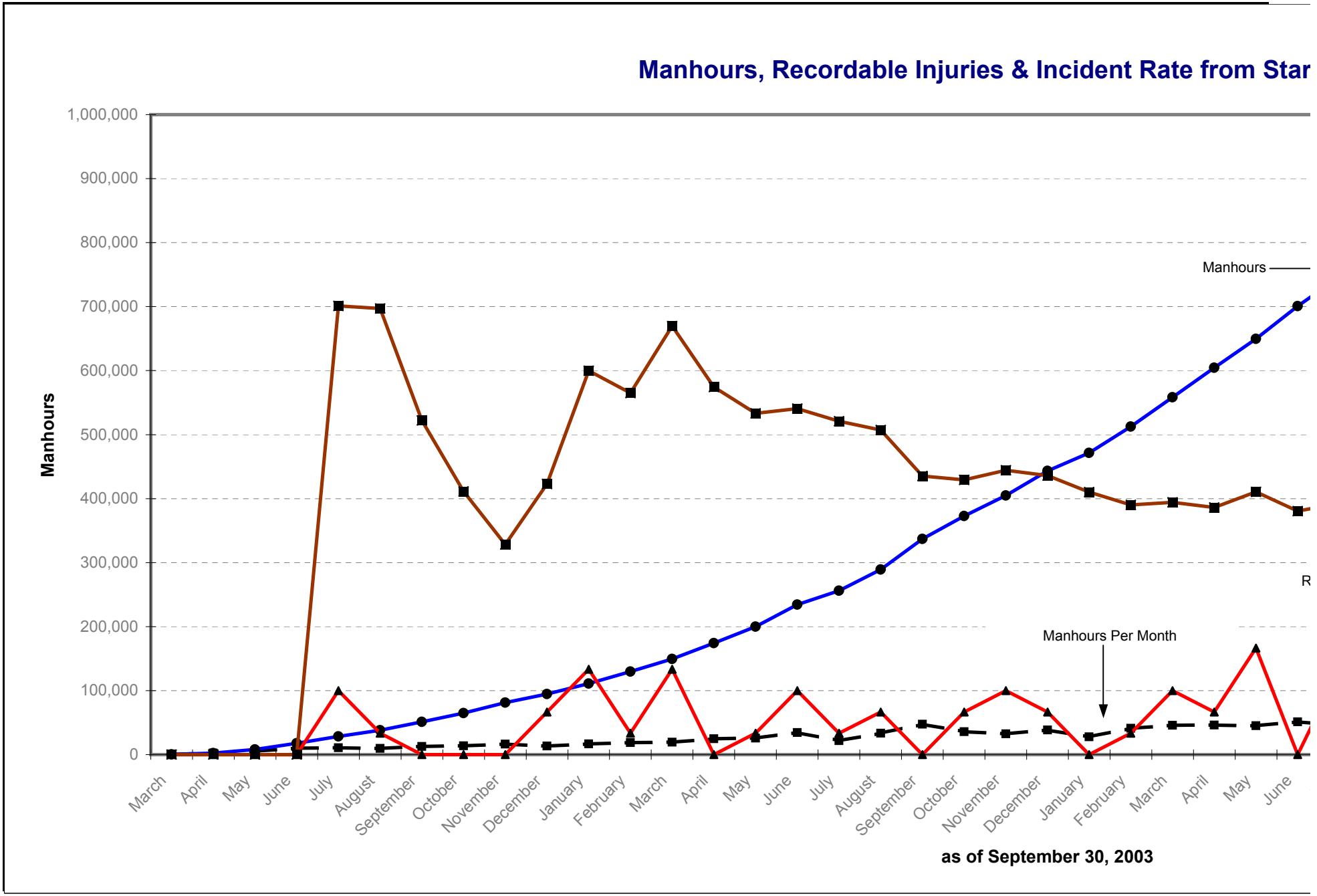
RBI continues to hold their daily huddles, which include a review of task hazards, and their weekly toolbox meetings. RBI also held their monthly safety meeting for all site personnel. NuMI Project personnel continue to monitor these meetings on a regular basis.

RBI continues to submit Hazard Analyses for review and acceptance to the SBO-CMO for all new tasks. RBI has generated in excess on one hundred and twenty-five hazard analyses for tasks being completed by subcontractor personnel.

There were no OSHA-recordable injuries during the month of September 2003. Also during the month of September RBI and their subcontractors surpassed 40 consecutive days without an OSHA-recordable injury.

Safety Performance for the NuMI Construction Project for 2003 Calendar Year to Date includes a Recordable Incident Rate of 4.3**,** a Lost Time Incident Rate of 2.2, and a Lost Workday Incident Rate of 2.2. The Project to Date Safety Performance includes a Recordable Incident Rate of 10.9, a Lost Time Incident Rate of 2.6, and a Lost Workday Incident Rate of 7.1. Figure 2 shows man-hours worked, and recordable injury and incident rates from the start of the NuMI construction subcontracts through September 2003.

NuMI TUNNEL and HALLS PROJECT
CONTRACTOR'S INJURY DATA



Environmental Issues – M. Andrews

Discharge results to be reported to the IEPA for September are as follows:

MINOS Outfall 004
TSS Ave. <1 mg/l
pH 7.68

Target Outfall 006
TSS Ave. NA
pH NA

During the month of September RBI has completed site cleanup, final grading and seeding operations at Target Site. RBI also completed 90% of hardstand removal, finish grading, topsoil and seeding of the Subcontractor parking lot along the west side of MI-8 Service Bldg. In addition, they have also completed site cleanup, final grading and seeding operations for the MINOS Water Treatment pond area.

FESS Operations continued 24 hr. operation of Minos sump water pumping into FNAL ICW. The temporary pumping system operated throughout the month without incident.

Ongoing erosion control findings:
RBI continues to make a good effort in resolving environmental findings throughout the month.

Radiation Safety – N. Grossman

The final methodology document "Residual Activation and Prompt Radiation Methodology Using MARS" has been reviewed internally to NuMI. Comments from the ES&H Section have been received and are being addressed. The document "Airborne Activation due to the Operation of the NuMI Beamline" is being updated. A Shielding Assessment/SAD meeting was held discussing the status of these two documents. No major issues were raised. The Draft NuMI Safety Assessment Documentation (SAD) was updated based on the Switchyard 120 SAD format and content.

VII. LEVEL 3 MILESTONES

The current NuMI/MINOS Level 3 Milestones are shown in Figure 3. Milestones for the period 7/03 to 9/05 are shown. The triangles are the fixed Fermilab milestones. Note that we show L3 milestones along with the new “L-3-n” identifiers. Actual dates of achieving milestones are shown as black diamonds. Currently projected dates for achieving milestones are shown as hollow diamonds. Projected milestone dates which differ from the fixed Fermilab milestone dates by more than two weeks are flagged as **<Late>** or **<Early>**.

VIII. VARIANCE ANALYSIS – G. Bock

Variances are reported in the cost and schedule reports against the NuMI Project's plan, which is considerably more aggressive than that required by the DOE milestones. In all cases the project remains comfortably ahead of schedule with respect to the DOE milestones and within baseline cost.

We include the Variance Summary Table. Cost and schedule variances against the project's plan are extracted from the Cost Tables in Section IX and shown here at Level 2.

DOE MILESTONES

This report includes an update of beneficial occupancy projection dates of the Target Area and MINOS area conventional facilities to October 20, 2003 and January 31, 2004, respectively. This forecast recognizes changes to the Ragnar Benson construction contract for various accumulated and projected changes associated with the job. Several remaining milestones are impacted. The current project forecast for completion of the project remains however slightly ahead of the projections of one year ago. Milestone forecast dates for all remaining DOE milestones continue to include comfortable amounts of float.

NuMI (WBS 1.1)

The Technical Components report a negative variance of ($281K) this month, an improvement of about $70K since last month. We are continuing to locate instances of under-reported progress and there are still some charges for spare components included in the project that we will be removing in the upcoming months. About half of the reported variance is thought to be real, and much of that is due to underestimates of labor in WBS 1.1.7 on water skid fabrication. A change request will be prepared. The favorable schedule variance continues ($1,147K).

NuMI (WBS 1.2)

Schedule variance: The additional effort during September at the Target Area reduced the associated schedule variance at the Target Area by $400K, but this reflects a "zero-sum game" (effort was redirected from MINOS to Target) -- the associated schedule variance at the MINOS Area increased by $400K. The total schedule variance remained at nearly $2000K, of which about $350K was at Target and $1600K at MINOS, at the end of September. The extension of the MINOS occupancy date to January 31, 2004 will reduce the schedule variance at MINOS by about $1050K, but it will still be necessary for Ragnar Benson and subcontractors to either increase effort or work multiple shifts (or both) to remove the remaining schedule variance at MINOS and complete the work by January 31. Ragnar Benson has said this will be done, and NuMI Project Management expects the Target Area to be delivered October 20 and the MINOS Area on January 31. Overall, project management remains pleased with the performance of this contract although we continue to monitor the progress closely.

Cost variance: There is no significant cost variance in WBS 1.2. A negative variance arising principally from an accrual against potential future claim settlements from work on the Tunnels

and Halls project is counterbalanced now by a positive variance on Title III. Costs for the Service Buildings and Outfitting contract remain comfortably on the plan.

NuMI (WBS 1.3)

Cost variance: There is a favorable cost variance of $707K.

MINOS (WBS 2)

Cost and Schedule variances: Some of the large favorable cost variances shown for the MINOS Detector are real. Work continues on closing out the contracts relating to far detector construction. Careful attention continues to be paid each month to the situation. There continue to be no real, significant schedule variances in WBS 2.0.

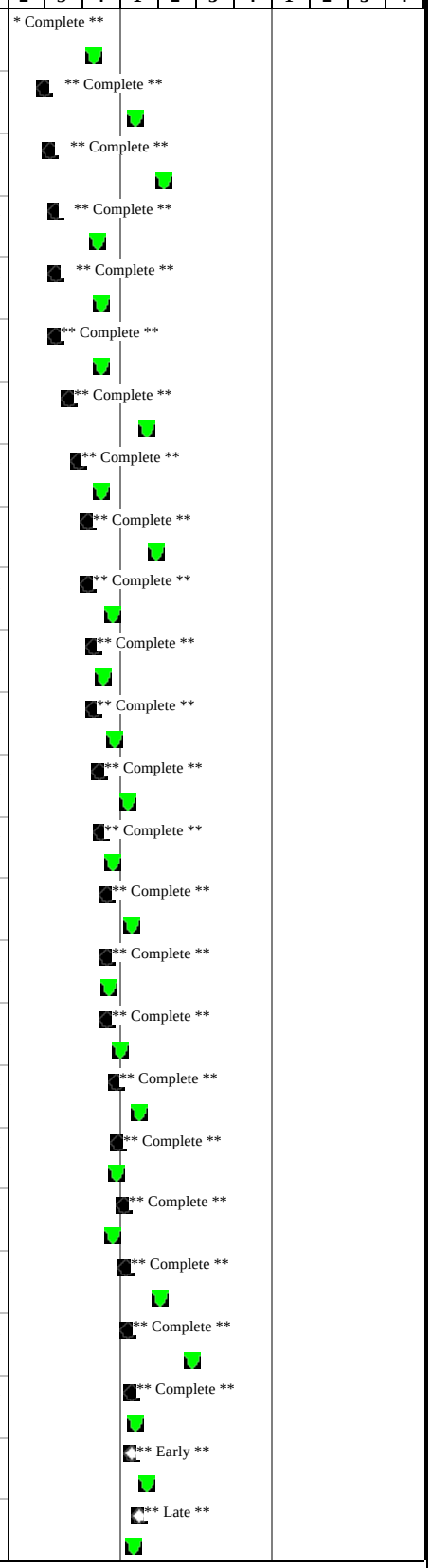
MINOS Cavern and Project Support (WBS 3)

The MINOS Cavern outfitting is complete. There is a small positive cost variance in WBS 3 which remains after the completion of MINOS project work in Soudan. There are no significant variances in WBS 3.

NuMI WBS Level 3 Milestones
(6/2003 - 9/2005)

10/17/03

Mlstn#	WBS Lev	Name	FNAL Cur Forecast	FNAL Base Date	Float
L-3-135	111	Operational Beam Permit Prototype	9/30/02	7/2/03	0 d
L-3-155	118	L3 Managers Review of Controls Syst Design Compl	3/3/03	10/10/03	0 d
L-3-196	112	Production Target Fabrication Complete	3/17/03	12/19/03	0 d
L-3-179	120	Pit Liner Complete	3/31/03	7/7/03	0 d
L-3-172	113	Kicker Power Supply Design & Dwgs Compl	3/31/03	7/17/03	0 d
L-3-173	114	Purch Order for Core Modules, Aluminum Submitted	4/1/03	7/15/03	0 d
L-3-192	117	U.S. LCW Syst Piping & Equip Installed in MI-62	4/30/03	11/7/03	0 d
L-3-175	118	Sub Req for Shaft Cables for SB&O Installation	5/23/03	7/15/03	0 d
L-3-178	114	Core Backshielding Steel Fabricated	6/16/03	11/28/03	0 d
L-3-191	120	Target Service Bldg Shell Complete	6/17/03	8/15/03	0 d
L-3-327	111	Conventional Magnets Ready for Installation in 2003 Shutdown	6/30/03	7/26/03	0 d
L-3-176	118	Cable System Specifications Complete	6/30/03	8/18/03	0 d
L-3-193	120	MSB Shell Complete	7/14/03	9/19/03	0 d
L-3-332	111	Pre-Target Magnet Stands Design & Drafting Complete	7/15/03	8/16/03	0 d
L-3-171	112	Upper Chase Shielding Fab & Installation Dwg Set Compl	7/31/03	9/29/03	0 d
L-3-174	112	Production Horn 1 Assembly Complete	7/31/03	8/7/03	0 d
L-3-328	111	Major Magnet Stands Ready for MI and Stub Installation	8/1/03	9/2/03	0 d
L-3-333	111	BPM Electronics Procurement Started	8/22/03	10/18/03	0 d
L-3-190	112	Complete Horn 2 Operational Testing in Test Stand	8/29/03	8/22/03	0 d
L-3-170	113	Transmission Line Design & Dwgs Compl	9/15/03	8/15/03	0 d
L-3-197	112	Complete Horn 1 Operational Testing in Test Stand	9/15/03	12/5/03	0 d
L-3-335	111	Complete Beam Permit System Input Parameters	9/22/03	2/21/04	0 d
L-3-194	112	Assembly of Horn 1 Module Complete	9/30/03	10/7/03	0 d
L-3-334	111	Start Construction of Multi-Wires	10/2/03	11/2/03	46 d
L-3-198	120	Beneficial Occupancy of UG Target Area	10/20/03	10/6/03	30 d

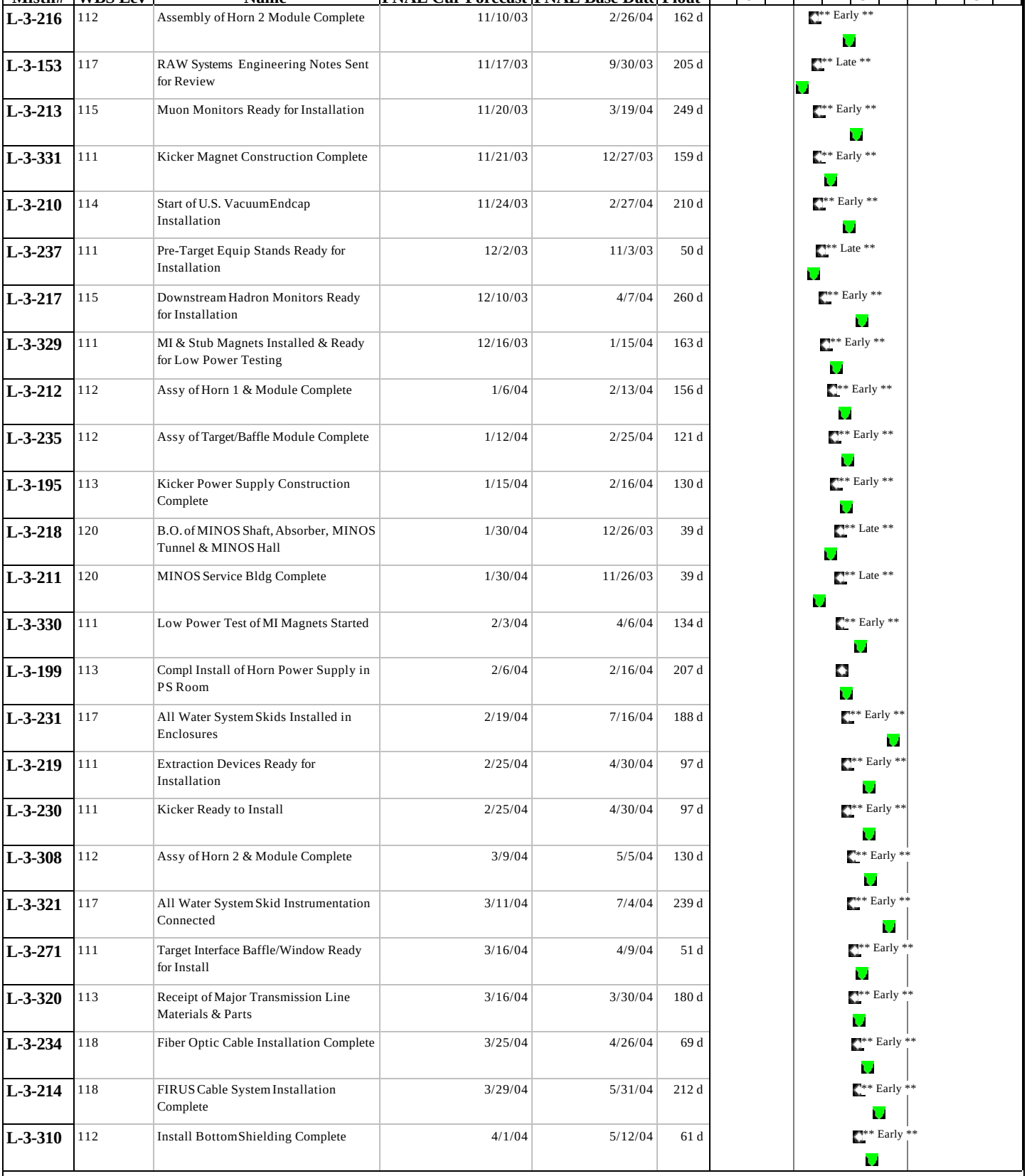


FNAL Current Forecast ◘ FNAL Baseline Date ■ Milestone Complete ●

NuMI WBS Level 3 Milestones
(6/2003 - 9/2005)

10/17/03

Mlstn#	WBS Lev	Name	FNAL Cur Forecast	FNAL Base Date	Float
L-3-216	112	Assembly of Horn 2 Module Complete	11/10/03	2/26/04	162 d
L-3-153	117	RAW Systems Engineering Notes Sent for Review	11/17/03	9/30/03	205 d
L-3-213	115	Muon Monitors Ready for Installation	11/20/03	3/19/04	249 d
L-3-331	111	Kicker Magnet Construction Complete	11/21/03	12/27/03	159 d
L-3-210	114	Start of U.S. VacuumEndcap Installation	11/24/03	2/27/04	210 d
L-3-237	111	Pre-Target Equip Stands Ready for Installation	12/2/03	11/3/03	50 d
L-3-217	115	Downstream Hadron Monitors Ready for Installation	12/10/03	4/7/04	260 d
L-3-329	111	MI & Stub Magnets Installed & Ready for Low Power Testing	12/16/03	1/15/04	163 d
L-3-212	112	Assy of Horn 1 & Module Complete	1/6/04	2/13/04	156 d
L-3-235	112	Assy of Target/Baffle Module Complete	1/12/04	2/25/04	121 d
L-3-195	113	Kicker Power Supply Construction Complete	1/15/04	2/16/04	130 d
L-3-218	120	B.O. of MINOS Shaft, Absorber, MINOS Tunnel & MINOS Hall	1/30/04	12/26/03	39 d
L-3-211	120	MINOS Service Bldg Complete	1/30/04	11/26/03	39 d
L-3-330	111	Low Power Test of MI Magnets Started	2/3/04	4/6/04	134 d
L-3-199	113	Compl Install of Horn Power Supply in PS Room	2/6/04	2/16/04	207 d
L-3-231	117	All Water System Skids Installed in Enclosures	2/19/04	7/16/04	188 d
L-3-219	111	Extraction Devices Ready for Installation	2/25/04	4/30/04	97 d
L-3-230	111	Kicker Ready to Install	2/25/04	4/30/04	97 d
L-3-308	112	Assy of Horn 2 & Module Complete	3/9/04	5/5/04	130 d
L-3-321	117	All Water System Skid Instrumentation Connected	3/11/04	7/4/04	239 d
L-3-271	111	Target Interface Baffle/Window Ready for Install	3/16/04	4/9/04	51 d
L-3-320	113	Receipt of Major Transmission Line Materials & Parts	3/16/04	3/30/04	180 d
L-3-234	118	Fiber Optic Cable Installation Complete	3/25/04	4/26/04	69 d
L-3-214	118	FIRUS Cable System Installation Complete	3/29/04	5/31/04	212 d
L-3-310	112	Install Bottom Shielding Complete	4/1/04	5/12/04	61 d

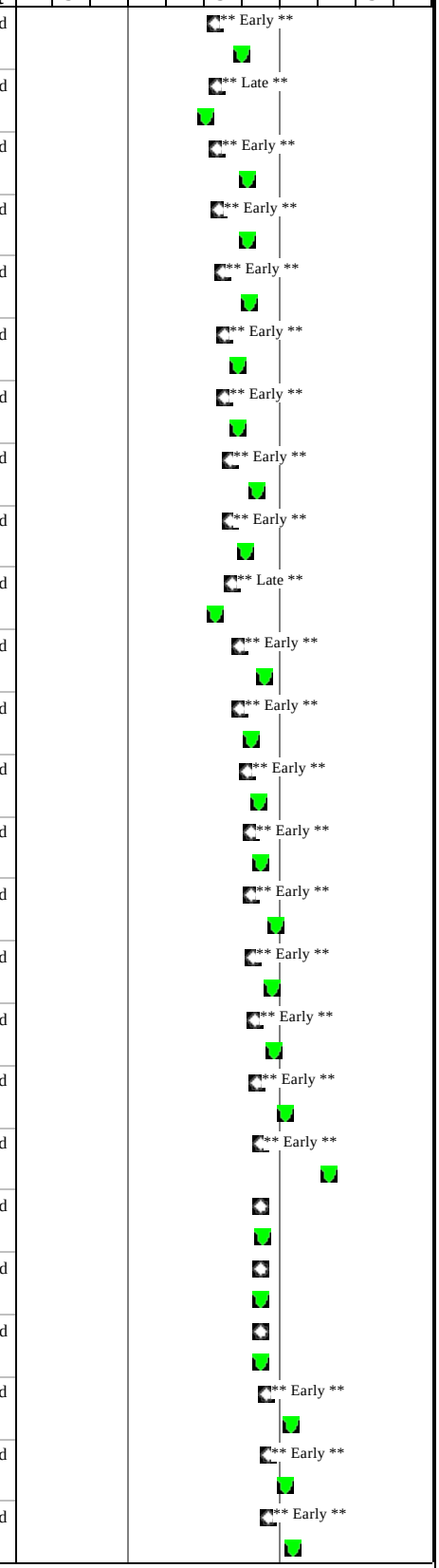


FNAL Current Forecast ◘ FNAL Baseline Date ■ Milestone Complete ●

NuMI WBS Level 3 Milestones
(6/2003 - 9/2005)

10/17/03

Mlstn#	WBS Lev	Name	FNAL Cur Forecast	FNAL Base Date	Float
L-3-239	114	Test of VacuumIntegrity Complete	4/2/04	6/1/04	134 d
L-3-252	111	Instrumentation Ready for Installation	4/6/04	3/5/04	38 d
L-3-236	116	Network in Target Hall	4/6/04	6/17/04	214 d
L-3-238	114	All Hadron Absorber Core Material Delivered	4/8/04	6/18/04	149 d
L-3-258	115	Downstream Hadron Monitor Installed	4/16/04	6/21/04	204 d
L-3-309	112	Assy of Target Baffle on Module Complete	4/21/04	5/27/04	113 d
L-3-326	118	Personnel Safety Interlock Syst Enginering & Des Compl	4/22/04	5/27/04	77 d
L-3-232	114	Start Absorber Outer Shielding Installation	5/3/04	7/9/04	156 d
L-3-315	112	Targ Pile Carriage Pads on Concrete Install Compl	5/3/04	6/13/04	61 d
L-3-250	113	Power Supply Refurbishing Complete	5/11/04	4/2/04	17 d
L-3-256	114	Assy of Core on Carrier Complete	5/28/04	7/27/04	134 d
L-3-251	111	Primary Beam Instrumentation Construction Compl	5/31/04	6/25/04	143 d
L-3-254	112	Compl Placement of Horn 1 into Target Station	6/15/04	7/12/04	68 d
L-3-276	113	Complete Assy/Installation of Stripline	6/23/04	7/21/04	136 d
L-3-257	118	MI60 Cable Syst Install Compl (Excl Trim Elements)	6/25/04	8/20/04	154 d
L-3-255	115	Muon Monitors Installed	6/29/04	8/13/04	153 d
L-3-314	112	Compl Placement of Horn 2 Assy into Target Station	7/6/04	8/18/04	68 d
L-3-311	111	Install Pre-target Instrumentation Complete	7/8/04	9/15/04	137 d
L-3-297	115	Downstream Hadron Monitor Operational	7/14/04	12/28/04	153 d
L-3-215	111	Lambertson Magnet Installation Complete	7/16/04	7/23/04	24 d
L-3-324	118	NuMI Stub Cables Installed	7/19/04	7/19/04	9 d
L-3-274	113	Power Test of TH Conventional Power Supplies Compl	7/21/04	7/15/04	6 d
L-3-322	118	Complete Installation of Devices in MI	7/30/04	9/29/04	131 d
L-3-293	118	MI-62 Cable System Installation Complete	8/3/04	9/17/04	128 d
L-3-270	112	Target & Horn Installation Complete	8/5/04	10/5/04	127 d

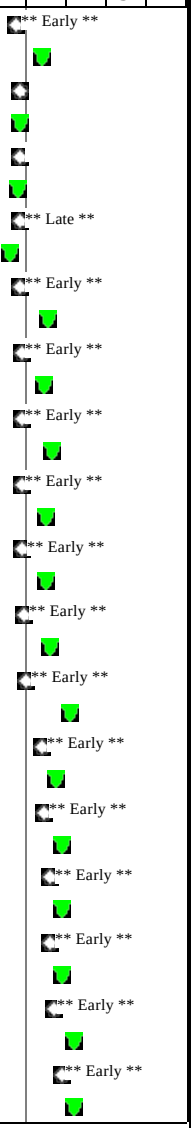


FNAL Current Forecast FNAL Baseline Date Milestone Complete

NuMI WBS Level 3 Milestones
(6/2003 - 9/2005)

10/17/03

Mlstn#	WBS Lev	Name	FNAL Cur Forecast	FNAL Base Date	Float
L-3-294	114	Checkout Absorber Complete	8/10/04	10/8/04	134 d
L-3-277	113	Compl Install & Testing of Kicker PS	8/17/04	8/16/04	2 d
L-3-318	113	Power Test of MI60 & MI-62 Power Supplies Complete	8/17/04	8/13/04	2 d
L-3-253	118	Pre-Targ Hall & Targ Hall Cable Syst Installation Compl	8/17/04	7/26/04	129 d
L-3-278	111	Pre-Target Installation Complete	8/19/04	10/22/04	127 d
L-3-291	111	MI Stub Installation Complete	8/20/04	10/13/04	115 d
L-3-299	111	Extraction & Primary Beam Checked Out	8/20/04	10/29/04	153 d
L-3-312	111	MI Installation Complete	8/20/04	10/18/04	126 d
L-3-259	118	Personnel Safety Interlock System Installation Complete	8/24/04	10/20/04	99 d
L-3-272	117	All Water Systems Checked Out	8/30/04	10/25/04	119 d
L-3-298	117	VacuumSystems Checked Out	8/31/04	12/10/04	118 d
L-3-290	112	Shielding Installation Complete (Pre-Hot Handling)	10/8/04	11/11/04	72 d
L-3-319	113	Start to Pulse & Checkout Horn System	10/11/04	11/25/04	73 d
L-3-295	112	Pulse & Checkout Horn System Complete	10/25/04	11/26/04	73 d
L-3-279	118	Controls Installation Complete	10/25/04	11/19/04	61 d
L-3-325	118	Controls Checkout Complete	11/1/04	12/20/04	76 d
L-3-296	115	Muon Monitors Operational	11/22/04	12/20/04	61 d

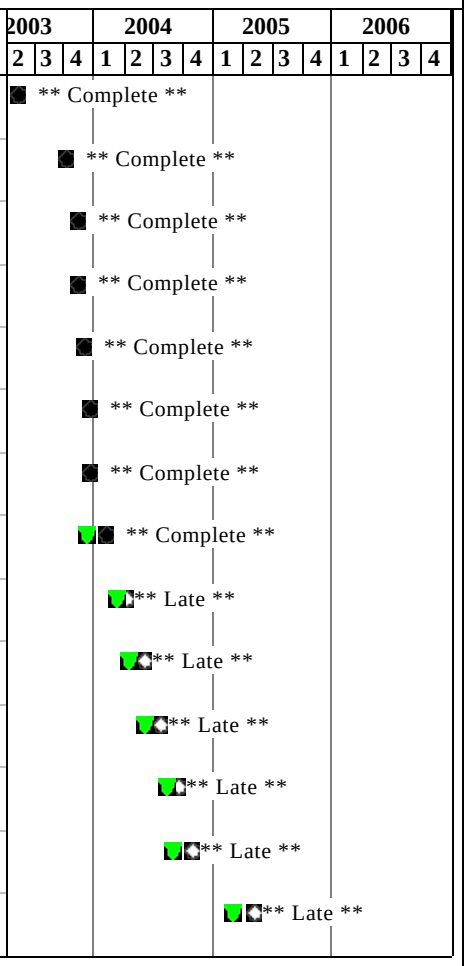


FNAL Current Forecast ◘ FNAL Baseline Date ■ Milestone Complete ●

MINOS WBS Level 3 Milestones
(6/2003 - 9/2005)

10/17/03

Mlstn #	WBS Lev 3	Name	FNAL Cur Forecast	FNAL Base Date	Float
L-3-266	225	50% of Near MUX Boxes Complete	1/2/03	6/30/03	0d
L-3-284	245	All SM2 Planes Installed	6/5/03	6/30/03	0d
L-3-300	245	Approve SM2 Coil Turnon - UMN/DNR/FNAL	7/9/03	9/15/03	0d
L-3-287	231	Complete Shipping for CalDet	7/10/03	7/10/03	0d
L-3-286	253	Complete Cable/Rack Mock-up	7/22/03	7/28/03	0d
L-3-288	222	100% of ND Clear Cables Complete	8/15/03	12/31/03	0d
L-3-285	225	100% of Near MUX Boxes Complete	8/15/03	12/30/03	0d
L-3-289	251	50% of ND Rack Assy Complete	9/30/03	7/31/03	0d
L-3-303	251	100% of ND Rack Assy Complete	12/2/03	10/29/03	82d
L-3-302	250	Near Detector Infrastructure Installation Started	1/30/04	12/10/03	45d
L-3-304	253	Begin Spectrometer Plane Installation	3/15/04	1/27/04	56d
L-3-301	231	Begin Near FE Electronics Installation	5/10/04	4/5/04	190d
L-3-305	253	25% Detector Installed	6/24/04	4/20/04	167d
L-3-306	250	Near Detector Installation Complete	12/27/04	10/22/04	40d



FNAL Current Forecast ◆ FNAL Baseline Date ▼ Milestone Complete ■

Variance Summary Table

(Cumulative to Date as of 9/30/03)

WBS / Description	Budgeted Cost		Actual Cost	Variance	
	Work Scheduled	Work Performed	Work Performed	Schedule	Cost
1.1 Technical Components	17,781	18,928	19,209	1,147	(281)
1.2 Facility Construction	67,035	65,113	64,975	(1,921)	138
1.3 Project Management	3,341	3,341	2,634	0	707
1.0 TEC Total	**88,157**	**87,383**	**86,818**	**(775)**	**564**
2.1 Magnets: Steel & Coils	7,539	7,540	7,622	1	(81)
2.2 Scintillator Detector Fabrication	19,535	19,540	19,525	5	15
2.3 Electronics, DAQ & Database	9,017	9,018	8,628	1	391
2.4 Far Detector Installation	5,077	5,077	4,369	0	707
2.5 Near Detector Installation	3,206	2,886	2,805	(320)	82
2.6 MINOS Project Management	1,546	1,546	1,603	0	(58)
UK In-Kind Contribution	(4,797)	(4,801)	(4,801)	(4)	0
2.0 MINOS Detector	**41,123**	**40,806**	**39,751**	**(317)**	**1,055**
3.1. NuMI Conceptual Design	1,934	1,934	1,928	0	6
3.2 MINOS Detector R&D	1,780	1,780	1,768	(0)	12
3.3 MINOS Cavern	14,527	14,527	14,527	0	0
3.4 Soudan/MINOS Operating	1,896	1,896	1,677	(0)	219
Minnesota Preconstruction Funds	(758)	(758)	(758)	0	0
Minnesota Contruction Funds FY99	(3,000)	(3,000)	(3,000)	0	0
3.0 NuMI Project Support	**16,378**	**16,378**	**16,142**	**0**	**237**
OPC Total	**57,501**	**57,185**	**55,893**	**(317)**	**1,292**
TPC Total	**145,659**	**144,568**	**142,711**	**(1,091)**	**1,856**

IX. COST REPORTS

Cost and earned value reports for the NuMI Project are presented in two sets, one for WBS 1.0 Total Estimated Cost (TEC), and a second for Other Project Costs (OPC) that includes both the MINOS Detector (WBS 2.0) and Project Support (WBS 3.0). Information for all segments of the project is summarized at WBS Level 3 except in the case of the OPC CURVE Reports that are at WBS Level 2 instead. The actual cost of work performed (ACWP) is comprised of the following: 1) costs collected and reported by the Fermilab financial system, 2) costs collected and reported to NuMI Project Management by the University of Minnesota in their monthly progress report for WBS 3.3 MINOS Cavern, and 3) an estimate of the value of work performed by the United Kingdom (UK) collaborating institutions towards their in-kind contribution. Since the UK collaborating institutions are not required to report their actual costs to NuMI Project Management, we are assuming that actual current period costs and cumulative costs are equal to current period earned value and cumulative earned value, respectively. Each set of cost and earned value reports includes the following:

CPR Format 1A
This is a modified version of the traditional CPR Format 1 report that shows indirect cost for each WBS Level 3 rather than as a single line item for the entire project. As a result it is possible to review the status of both burdened and unburdened costs for each major system or cost component. In addition, the report for the OPC includes a summary section at the end, with WBS Level 2 totals for the MINOS Detector and Project Support segments of the project.

CPR Format 3
This is the traditional format for reporting changes to the project baseline that were approved and implemented in the current reporting period, as well as their impact on the time phased project baseline.

CURVE Reports
These graphically depict cumulative Budgeted Cost of Work Scheduled (BCWS), Budgeted Cost of Work Performed (BCWP), and Actual Cost of Work Performed (ACWP), at WBS Level 3 and WBS Level 2 for the TEC and OPC, respectively. The OPC reports reflect all project costs, including the UK In-Kind Contribution, and also funding contributed ($3.758M) by the University of Minnesota. All amounts shown are fully burdened.

Plan v Act Reports
These reports compare burdened planned costs (BCWS) with burdened actual costs (ACWP) on a cumulative basis through the end of the prior fiscal year, and by month for the current fiscal year. There are two versions of this report, one for total cost, and a second for labor costs only. Both OPC versions exclude the value of UK In-Kind Contributions and thus represent US Funds only.

NuMI Project Obligations
This report reflects burdened obligations to date, including requisitions in progress, for the entire project, as recorded in the Fermilab financial system. Consequently, it does not include any assumed obligations with respect to work performed by the UK collaborating institutions. Nor

does it reflect actual amounts obligated by the University of Minnesota under the grant for WBS 3.3 MINOS Cavern; instead, obligations shown for WBS 3.3 represent the cumulative amount of the Financial Plan transfers to the University of Minnesota from the Fermilab budget.

NuMI Project TEC

($000's Omitted)

Cost Performance Report - Work Breakdown Structure													
Contractor:	Fermi National Accelerator Laboratory				Contract Type/No:			Project Name/No:		Report Period:			
Location:	Batavia							NuMI TEC		8/31/03	9/30/03		
Quantity	Negotiated Cost		Est. Cost Authorized Unpriced Work		Tgt. Profit/ Fee %		Tgt. Price	Est Price	Share Ratio	Contract Ceiling	Estimated Contract Ceiling		
1	109,242		0		0	0	109,242	0		0	0		
WBS[2]	Current Period					Cumulative to Date					At Completion		
WBS[3]			Actual					Actual					
Results...	Budgeted Cost		Cost	Variance		Budgeted Cost		Cost	Variance			Latest	
	Work	Work	Work			Work	Work	Work				Revised	
Item	Scheduled	Performed	Performed	Schedule	Cost	Scheduled	Performed	Performed	Schedule	Cost	Budgeted	Estimate	Variance
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1.1 Technical Components													
1.1.1 Extraction & Primary Beam													
Direct Cost + Escalation	203	184	152	(19)	32	3,153	3,030	3,007	(123)	23	3,969	3,969	0
Indirect Cost	44	36	40	(8)	(4)	748	713	762	(34)	(49)	917	917	0
WBS[3]Totals:	247	220	192	(27)	28	3,900	3,743	3,769	(157)	(26)	4,887	4,887	0
1.1.2 Neutrino Beam Devices													
Direct Cost + Escalation	172	167	200	(5)	(33)	5,807	6,263	6,331	456	(68)	8,121	8,121	0
Indirect Cost	34	38	48	4	(10)	1,383	1,490	1,459	107	31	1,892	1,892	0
WBS[3]Totals:	206	205	248	(1)	(43)	7,190	7,753	7,790	563	(37)	10,012	10,012	0
1.1.3 Power Supply System													
Direct Cost + Escalation	86	82	62	(4)	20	3,184	3,131	3,223	(53)	(92)	3,827	3,827	0
Indirect Cost	19	14	10	(5)	4	774	763	769	(11)	(6)	910	910	0
WBS[3]Totals:	105	96	71	(9)	25	3,958	3,894	3,991	(65)	(97)	4,738	4,738	0
1.1.4 Hadron Decay and Absorber													
Direct Cost + Escalation	23	9	4	(14)	5	438	431	549	(7)	(118)	1,081	1,081	0
Indirect Cost	5	3	1	(3)	1	125	123	141	(1)	(18)	251	251	0
WBS[3]Totals:	29	12	6	(17)	6	563	554	689	(9)	(135)	1,332	1,332	0
1.1.5 Neutrino Beam Monitoring													
Direct Cost + Escalation	13	0	32	(13)	(32)	264	368	247	104	121	455	455	0
Indirect Cost	0	0	0	(0)	(0)	23	24	36	2	(11)	26	26	0
WBS[3]Totals:	13	0	32	(13)	(32)	286	392	283	106	109	481	481	0
1.1.6 Alignment Systems													
Direct Cost + Escalation	2	0	3	(1)	(3)	200	199	151	(1)	48	240	240	0
Indirect Cost	1	0	1	(0)	(0)	57	57	39	0	18	68	68	0
WBS[3]Totals:	2	0	4	(2)	(3)	257	256	190	(1)	66	308	308	0
1.1.7 Water, Vacuum & Gas Systems													
Direct Cost + Escalation	90	34	62	(56)	(28)	650	956	1,123	306	(167)	1,778	1,778	0
Indirect Cost	17	8	12	(10)	(4)	156	221	247	65	(26)	407	407	0
WBS[3]Totals:	108	42	74	(66)	(32)	806	1,177	1,371	372	(193)	2,185	2,185	0
1.1.8 Installation and Integration													
Direct Cost + Escalation	26	163	60	137	103	601	874	884	273	(10)	2,262	2,262	0
Indirect Cost	6	30	12	24	18	158	222	180	64	42	502	502	0
WBS[3]Totals:	31	193	71	161	121	759	1,096	1,063	337	32	2,764	2,764	0
1.1.9 Hadronic Hose (Close-out)													
Direct Cost + Escalation	0	0	0	0	0	53	53	54	0	(0)	53	53	0
Indirect Cost	0	0	0	0	0	9	9	9	0	(0)	9	9	0
WBS[3]Totals:	0	0	0	0	0	62	62	63	0	(1)	62	62	0
WBS[2]Totals:	741	768	697	28	71	17,781	18,928	19,209	1,147	(281)	26,768	26,768	0

NuMI Project TEC

($000's Omitted)

Cost Performance Report - Work Breakdown Structure													
Contractor: Fermi National Accelerator Laboratory Location: Batavia				Contract Type/No:			Project Name/No: NuMI TEC		Report Period: 8/31/03 9/30/03				
Quantity	Negotiated Cost		Est. Cost Authorized Unpriced Work	Tgt. Profit/ Fee %		Tgt. Price	Est Price	Share Ratio	Contract Ceiling	Estimated Contract Ceiling			
1	109,242		0	0	0	109,242	0		0	0			
WBS[2]	Current Period					Cumulative to Date					At Completion		
WBS[3] Results...	Budgeted Cost		Actual Cost	Variance		Budgeted Cost		Actual Cost	Variance			Latest	
Item	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Budgeted	Revised Estimate	Variance
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1.2 Facility Construction													
1.2.1 Facility Physics Design Phase													
Direct Cost + Escalation	0	0	0	0	0	49	49	52	0	(3)	49	49	0
Indirect Cost	0	0	0	0	0	21	21	19	0	2	21	21	0
WBS[3]Totals:	0	0	0	0	0	70	70	70	0	(0)	70	70	0
1.2.2 Facility Construction Title I Design Phase													
Direct Cost + Escalation	0	0	0	0	0	1,254	1,254	1,288	0	(34)	1,254	1,254	0
Indirect Cost	0	0	0	0	0	184	184	149	0	35	184	184	0
WBS[3]Totals:	0	0	0	0	0	1,438	1,438	1,437	0	1	1,438	1,438	0
1.2.3 Facility Construction Title II Design Phase													
Direct Cost + Escalation	0	0	0	0	0	2,620	2,620	2,807	0	(187)	2,620	2,620	0
Indirect Cost	0	0	0	0	0	355	355	167	0	188	355	355	0
WBS[3]Totals:	0	0	0	0	0	2,975	2,975	2,974	0	1	2,975	2,975	0
1.2.4 Facility Construction Phase													
Direct Cost + Escalation	768	1,157	1,484	389	(327)	61,023	59,115	59,152	(1,908)	(38)	61,967	61,967	0
Indirect Cost	27	15	26	(12)	(10)	1,528	1,515	1,341	(13)	174	1,596	1,596	0
WBS[3]Totals:	795	1,172	1,510	377	(338)	62,551	60,630	60,493	(1,921)	136	63,563	63,563	0
WBS[2]Totals:	795	1,172	1,510	377	(338)	67,035	65,113	64,975	(1,921)	138	68,047	68,047	0
1.3 Project Management													
1.3.1 FY 98 Project Management													
Direct Cost + Escalation	0	0	0	0	0	208	208	104	0	104	208	208	0
Indirect Cost	0	0	0	0	0	66	66	37	0	29	66	66	0
WBS[3]Totals:	0	0	0	0	0	275	275	141	0	133	275	275	0
1.3.2 FY 99 Project Management													
Direct Cost + Escalation	0	0	0	0	0	425	425	512	0	(88)	425	425	0
Indirect Cost	0	0	0	0	0	135	135	149	0	(14)	135	135	0
WBS[3]Totals:	0	0	0	0	0	560	560	661	0	(102)	560	560	0
1.3.3 FY 00 Project Management													
Direct Cost + Escalation	0	0	0	0	0	436	436	521	0	(85)	436	436	0
Indirect Cost	0	0	0	0	0	139	139	142	0	(3)	139	139	0
WBS[3]Totals:	0	0	0	0	0	575	575	663	0	(88)	575	575	0
1.3.4 FY 01 Project Management													
Direct Cost + Escalation	0	0	0	0	0	522	522	331	0	191	522	522	0
Indirect Cost	0	0	0	0	0	166	166	92	0	74	166	166	0
WBS[3]Totals:	0	0	0	0	0	688	688	423	0	265	688	688	0

NuMI Project TEC

($000's Omitted)

Cost Performance Report - Work Breakdown Structure													
Contractor:	Fermi National Accelerator Laboratory				Contract Type/No:			Project Name/No:		Report Period:			
Location:	Batavia							NuMI TEC		8/31/03	9/30/03		
Quantity	Negotiated Cost		Est. Cost Authorized Unpriced Work		Tgt. Profit/ Fee %		Tgt. Price	Est Price	Share Ratio	Contract Ceiling	Estimated Contract Ceiling		
1	109,242		0		0	0	109,242	0		0	0		
WBS[2]	Current Period					Cumulative to Date					At Completion		
WBS[3]	Budgeted Cost		Actual Cost	Variance		Budgeted Cost		Actual Cost	Variance			Latest	
Results...	Work	Work	Work			Work	Work	Work				Revised	
Item	Scheduled	Performed	Performed	Schedule	Cost	Scheduled	Performed	Performed	Schedule	Cost	Budgeted	Estimate	Variance
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1.3.5 FY 02 Project Management													
Direct Cost + Escalation	0	0	0	0	0	533	533	253	0	281	533	533	0
Indirect Cost	0	0	0	0	(0)	170	170	72	0	98	170	170	0
WBS[3]Totals:	0	0	0	0	(0)	703	703	324	0	378	703	703	0
1.3.6 FY 03 Project Management													
Direct Cost + Escalation	35	33	28	(2)	5	411	411	324	0	87	411	411	0
Indirect Cost	11	10	8	(1)	2	131	131	98	0	33	131	131	0
WBS[3]Totals:	46	43	37	(2)	7	541	541	421	0	120	541	541	0
1.3.7 FY 04 Project Management													
Direct Cost + Escalation	0	0	0	0	0	0	0	0	0	0	499	499	0
Indirect Cost	0	0	0	0	0	0	0	0	0	0	159	159	0
WBS[3]Totals:	0	0	0	0	0	0	0	0	0	0	658	658	0
1.3.8 FY 05 Project Management													
Direct Cost + Escalation	0	0	0	0	0	0	0	0	0	0	251	251	0
Indirect Cost	0	0	0	0	0	0	0	0	0	0	80	80	0
WBS[3]Totals:	0	0	0	0	0	0	0	0	0	0	330	330	0
WBS[2]Totals:	46	43	37	(2)	7	3,341	3,341	2,634	0	707	4,330	4,330	0
General and Adminstrative	0	0	0	0	0	0	0	0	0	0	0	0	0
Undistributed Budget											0	0	0
Sub Total	1,581	1,984	2,244	403	(260)	88,157	87,383	86,818	(775)	564	99,145	99,145	0
Contingency											10,097	10,097	0
Total	1,581	1,984	2,244	403	(260)	88,157	87,383	86,818	(775)	564	109,242	109,242	0

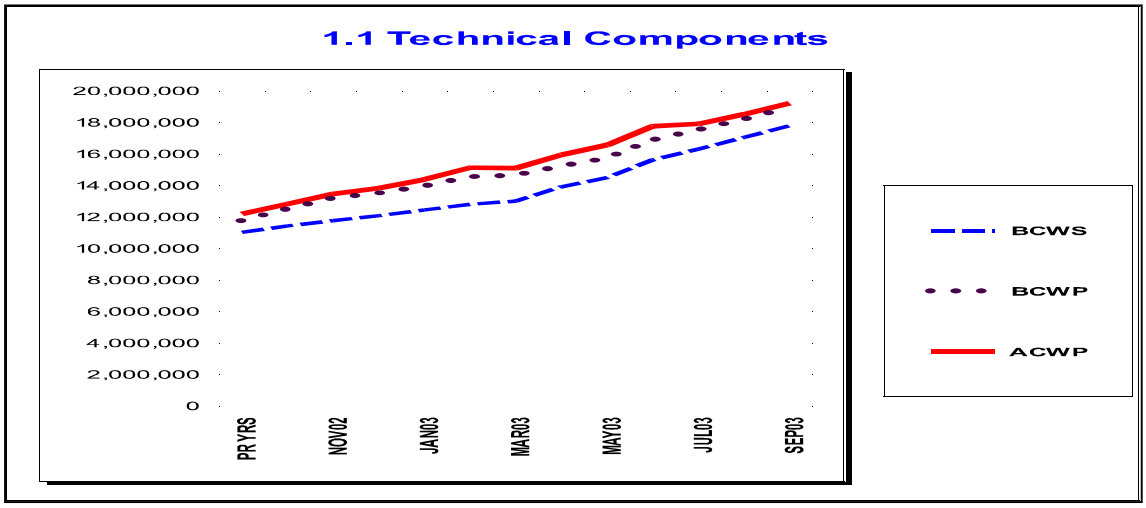
NuMI Project TEC

($000's Omitted)

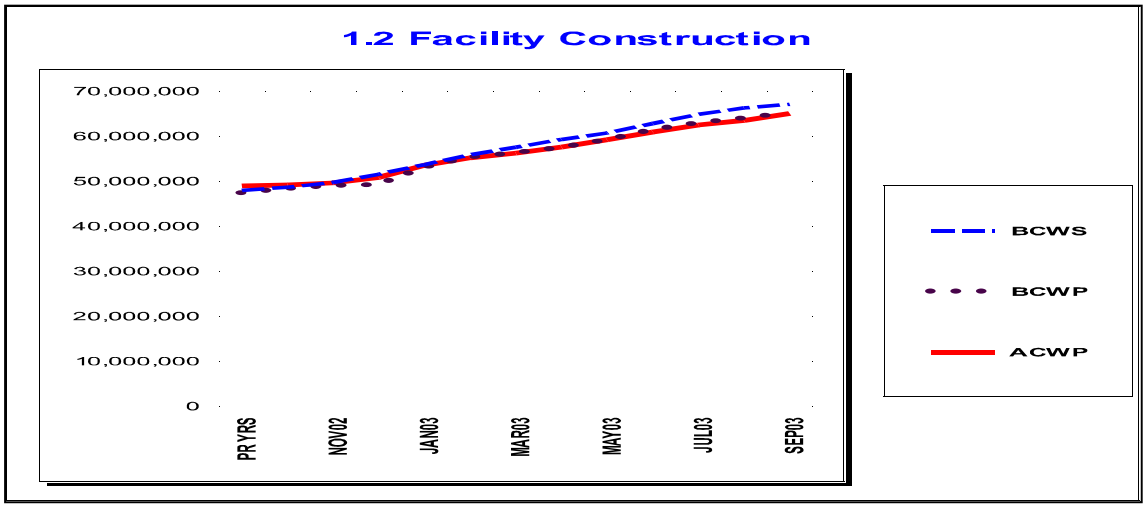
Cost Performance Report - Baseline															
Contractor:	Fermi National Accelerator Laboratory			Contract Type/No:		Project Name/No:				Report Period:					
Location:	Batavia					NuMI TEC				8/31/03		9/30/03			
(1) Original Contract Target Cost		(2) Negotiated Contract Changes		(3) Current Target Cost		(4) Est. Cost Authorized Authorized Unpriced Work			(5) Contract Budget Base (3) + (4)			(6) Total Allocated Budget		(7) Difference (5) - (6)	
76,200		33,042		109,242		0			109,242			109,242		(0)	
(8) Contract Start Date 10/1/97		(9) Contract Definitization Date 10/1/97				(10) Last Item Delivery Date 9/30/03			(11) Contract Completion Date 9/30/03			(12) Estimated Completion Date 9/30/03			
Item	BCWS Cum to Date	BCWS for Report Period	Budgeted Cost for Work Scheduled (Non-Cumulative) Six Month Forecast +1 OCT03	+2 NOV03	+3 DEC03	+4 JAN04	+5 FEB04	+6 MAR04	(Enter Specific Periods) BAL FY04	FY05				Undist Budget	Total Budget
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
PM Baseline (Beginning of Period)	86,565	1,576	1,280	1,018	1,411	1,200	1,151	673	3,059	1,046	0	0	0	0	98,979
242 Replan WBS 1.1.4															(113)
243 Add Change Orders to RBI Budget															279
PM Baseline (End of Period)	88,157		1,582	1,035	1,385	1,250	1,181	626	3,134	795	0	0	0	0	99,145
Contingency															10,097
Total															109,242

NuMI Project TEC

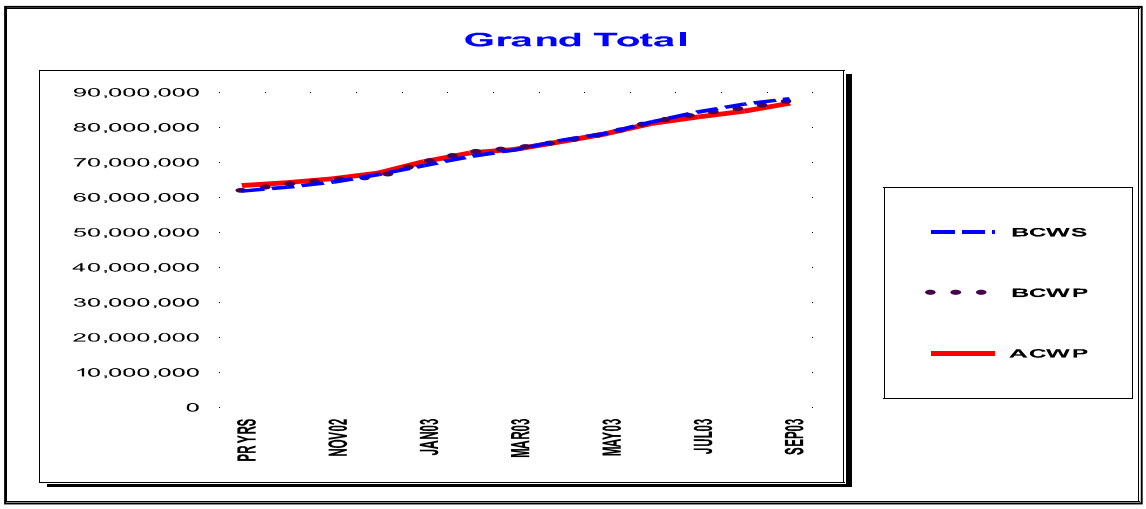
($000's Omitted)



	PR YRS	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03	APR03	MAY03	JUN03	JUL03	AUG03	SEP03
BCWS	11,011	11,422	11,762	12,073	12,438	12,790	13,001	13,907	14,487	15,619	16,296	17,041	17,781
BCWP	11,732	12,478	13,171	13,478	13,926	14,523	14,619	15,194	15,697	16,849	17,498	18,160	18,928
ACWP	12,185	12,818	13,455	13,820	14,371	15,118	15,086	15,933	16,560	17,746	17,897	18,512	19,209



	PR YRS	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03	APR03	MAY03	JUN03	JUL03	AUG03	SEP03
BCWS	47,919	48,608	49,674	51,521	53,664	55,826	57,504	59,224	60,663	62,766	64,816	66,240	67,035
BCWP	47,317	48,266	48,934	49,132	52,981	55,206	56,216	57,376	59,082	61,354	62,887	63,941	65,113
ACWP	48,918	49,114	49,580	50,805	53,477	55,162	56,207	57,551	59,155	60,881	62,456	63,465	64,975



	PR YRS	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03	APR03	MAY03	JUN03	JUL03	AUG03	SEP03
BCWS	61,730	62,878	64,327	66,530	69,087	71,641	73,574	76,246	78,311	81,589	84,364	86,576	88,157
BCWP	61,849	63,600	65,014	65,572	69,926	72,796	73,955	75,742	78,003	81,409	83,634	85,399	87,383
ACWP	63,315	64,175	65,308	66,920	70,175	72,642	73,695	75,926	78,198	81,145	82,913	84,575	86,818

NuMI Project TEC

($000's Omitted)

Program:	Description:	Approval:
NUMITEC	NuMI TEC	Program Manager
Run Date: 10/14/03	Status Date: 9/30/2003	Functional Manager
		Cost Account Manager

DESCRIPTION		PR YRS	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03	APR03	MAY03	JUN03	JUL03	AUG03	SEP03	FY04	FY05	TOTAL
1.1 Technical Components																	
1.1.1 Extraction & Primary Beam	BCWS	1,513	73	85	95	109	109	128	539	208	383	178	232	247	975	12	4,887
	ACWP	1,778	147	100	97	141	205	158	278	170	223	118	164	192	0	0	3,769
1.1.2 Neutrino Beam Devices	BCWS	5,010	256	186	144	183	152	-279	181	195	425	277	254	206	2,657	166	10,012
	ACWP	5,329	269	403	229	237	276	-447	298	255	257	182	255	248	0	0	7,790
1.1.3 Power Supply System	BCWS	2,708	58	44	46	48	49	247	78	77	263	161	75	105	777	2	4,738
	ACWP	3,105	147	49	13	84	68	102	85	67	70	70	60	71	0	0	3,991
1.1.4 Hadron Decay and Absorber	BCWS	432	3	5	6	2	2	11	9	9	17	9	30	29	769	0	1,332
	ACWP	486	13	15	2	10	13	45	59	29	445	-434	1	6	0	0	689
1.1.5 Neutrino Beam Monitoring	BCWS	182	1	1	2	11	10	10	10	11	12	13	12	13	167	28	481
	ACWP	108	0	6	0	5	11	17	5	10	23	28	39	32	0	0	283
1.1.6 Alignment Systems	BCWS	219	6	6	6	2	2	2	2	2	2	2	2	2	38	13	308
	ACWP	174	6	-3	0	4	1	0	0	0	0	6	-3	4	0	0	190
1.1.7 Water, Vacuum & Gas Systems	BCWS	399	5	2	1	4	14	31	81	69	22	23	46	108	1,353	26	2,185
	ACWP	523	41	64	10	13	127	80	96	78	113	93	59	74	0	0	1,371
1.1.8 Installation and Integration	BCWS	486	8	11	10	6	15	62	6	10	7	14	94	31	1,786	219	2,764
	ACWP	619	10	4	14	58	47	13	25	18	55	88	41	71	0	0	1,063
1.1.9 Hadronic Hose (Close-out)	BCWS	62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62
	ACWP	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63
WBS[2] Totals:	BCWS	11,011	411	340	310	365	352	211	906	580	1,131	677	745	741	8,522	465	26,768
	ACWP	12,185	633	637	365	551	747	-32	847	627	1,187	151	615	697	0	0	19,209
1.2 Facility Construction																	
1.2.1 Facility Physics Design Phase	BCWS	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70
	ACWP	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70
1.2.2 Facility Construction Title I Design Phase	BCWS	1,438	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,438
	ACWP	1,437	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,437
1.2.3 Facility Construction Title II Design Phase	BCWS	2,975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,975
	ACWP	2,974	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,974
1.2.4 Facility Construction Phase	BCWS	43,435	689	1,065	1,847	2,143	2,162	1,678	1,720	1,440	2,103	2,049	1,424	795	1,012	0	63,563
	ACWP	44,436	196	466	1,225	2,671	1,686	1,045	1,344	1,604	1,727	1,575	1,009	1,510	0	0	60,493
WBS[2] Totals:	BCWS	47,919	689	1,065	1,847	2,143	2,162	1,678	1,720	1,440	2,103	2,049	1,424	795	1,012	0	68,047
	ACWP	48,918	196	466	1,225	2,671	1,686	1,045	1,344	1,604	1,727	1,575	1,009	1,510	0	0	64,975
1.3 Project Management																	
1.3.1 FY 98 Project Management	BCWS	275	0	0	0	0	0	0	0	0	0	0	0	0	0	0	275
	ACWP	141	0	0	0	0	0	0	0	0	0	0	0	0	0	0	141
1.3.2 FY 99 Project Management	BCWS	560	0	0	0	0	0	0	0	0	0	0	0	0	0	0	560
	ACWP	661	0	0	0	0	0	0	0	0	0	0	0	0	0	0	661
1.3.3 FY 00 Project Management	BCWS	575	0	0	0	0	0	0	0	0	0	0	0	0	0	0	575
	ACWP	663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	663
1.3.4 FY 01 Project Management	BCWS	688	0	0	0	0	0	0	0	0	0	0	0	0	0	0	688
	ACWP	423	0	0	0	0	0	0	0	0	0	0	0	0	0	0	423
1.3.5 FY 02 Project Management	BCWS	703	0	0	0	0	0	0	0	0	0	0	0	0	0	0	703
	ACWP	324	0	0	0	0	0	0	0	0	0	0	0	0	0	0	324
1.3.6 FY 03 Project Management	BCWS	0	48	44	46	48	41	44	46	46	44	48	44	46	0	0	541
	ACWP	0	31	29	22	32	34	41	41	41	33	43	38	37	0	0	421

NuMI Project TEC

($000's Omitted)

Program:	Description:	Approval:
NUMITEC	NuMI TEC	Program Manager
Run Date: 10/14/03	Status Date: 9/30/2003	Functional Manager
		Cost Account Manager

DESCRIPTION		PR YRS	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03	APR03	MAY03	JUN03	JUL03	AUG03	SEP03	FY04	FY05	TOTAL
1.3.7 FY 04 Project Management	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	658	0	658
	ACWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.3.8 FY 05 Project Management	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	330	330
	ACWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WBS[2] Totals:	BCWS	2,800	48	44	46	48	41	44	46	46	44	48	44	46	658	330	4,330
	ACWP	2,213	31	29	22	32	34	41	41	41	33	43	38	37	0	0	2,634
Grand Totals:	BCWS	61,730	1,148	1,449	2,203	2,556	2,555	1,933	2,672	2,065	3,278	2,775	2,212	1,581	10,193	795	99,145
	ACWP	63,315	860	1,133	1,612	3,255	2,467	1,053	2,231	2,272	2,946	1,769	1,661	2,244	0	0	86,818

NuMI Project TEC - Labor Only

($000's Omitted)

Program:	Description:	Approval:
NUMITEC	NuMI TEC	Program Manager
Run Date: 10/16/03	Status Date: 9/30/2003	Functional Manager
		Cost Account Manager

DESCRIPTION		PR YRS	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03	APR03	MAY03	JUN03	JUL03	AUG03	SEP03	FY04	FY05	TOTAL
1.1 Technical Components																	
1.1.1 Extraction & Primary Beam	BCWS	872	43	49	58	70	61	56	68	65	300	104	97	92	282	12	2,230
	ACWP	922	53	73	45	103	127	268	215	158	125	64	106	129	0	0	2,388
1.1.2 Neutrino Beam Devices	BCWS	2,645	71	67	69	77	66	267	61	58	256	68	58	54	975	121	4,910
	ACWP	2,951	123	151	35	170	160	198	159	145	157	127	128	124	0	0	4,630
1.1.3 Power Supply System	BCWS	1,525	24	13	14	13	18	129	31	39	222	28	26	39	250	2	2,374
	ACWP	1,832	55	38	5	53	42	408	52	47	38	25	19	8	0	0	2,622
1.1.4 Hadron Decay and Absorber	BCWS	378	3	5	6	2	2	3	3	3	11	9	12	14	169	0	619
	ACWP	445	4	7	1	9	11	14	24	29	8	0	0	5	0	0	555
1.1.5 Neutrino Beam Monitoring	BCWS	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78
	ACWP	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74
1.1.6 Alignment Systems	BCWS	172	6	6	6	2	2	2	2	2	2	2	2	2	32	5	244
	ACWP	126	6	-3	0	1	0	6	0	0	0	6	-3	0	0	0	140
1.1.7 Water, Vacuum & Gas Systems	BCWS	245	5	2	1	4	14	31	25	22	16	18	10	21	524	26	964
	ACWP	308	16	16	-2	10	34	47	59	37	45	32	23	11	0	0	634
1.1.8 Installation and Integration	BCWS	434	4	7	5	2	11	9	1	5	3	9	4	12	460	120	1,088
	ACWP	243	10	3	13	11	7	14	10	14	16	14	15	14	0	0	383
1.1.9 Hadronic Hose (Close-out)	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ACWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WBS[2] Totals:	BCWS	6,349	155	148	158	169	175	496	192	194	810	239	210	235	2,693	286	12,506
	ACWP	6,900	266	285	98	357	381	954	519	430	388	267	289	292	0	0	11,426
1.2 Facility Construction																	
1.2.1 Facility Physics Design Phase	BCWS	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70
	ACWP	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70
1.2.2 Facility Construction Title I Design Phase	BCWS	300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	300
	ACWP	299	0	0	0	0	0	0	0	0	0	0	0	0	0	0	299
1.2.3 Facility Construction Title II Design Phase	BCWS	556	0	0	0	0	0	0	0	0	0	0	0	0	0	0	556
	ACWP	556	0	0	0	0	0	0	0	0	0	0	0	0	0	0	556
1.2.4 Facility Construction Phase	BCWS	1,944	114	86	70	72	63	66	69	69	66	72	66	69	244	0	3,071
	ACWP	1,754	99	95	46	139	128	93	86	99	90	65	74	85	0	0	2,853
WBS[2] Totals:	BCWS	2,870	114	86	70	72	63	66	69	69	66	72	66	69	244	0	3,998
	ACWP	2,679	99	95	46	139	128	93	86	99	90	65	74	85	0	0	3,778
1.3 Project Management																	
1.3.1 FY 98 Project Management	BCWS	275	0	0	0	0	0	0	0	0	0	0	0	0	0	0	275
	ACWP	125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	125
1.3.2 FY 99 Project Management	BCWS	560	0	0	0	0	0	0	0	0	0	0	0	0	0	0	560
	ACWP	595	0	0	0	0	0	0	0	0	0	0	0	0	0	0	595
1.3.3 FY 00 Project Management	BCWS	575	0	0	0	0	0	0	0	0	0	0	0	0	0	0	575
	ACWP	616	0	0	0	0	0	0	0	0	0	0	0	0	0	0	616
1.3.4 FY 01 Project Management	BCWS	688	0	0	0	0	0	0	0	0	0	0	0	0	0	0	688
	ACWP	416	0	0	0	0	0	0	0	0	0	0	0	0	0	0	416
1.3.5 FY 02 Project Management	BCWS	703	0	0	0	0	0	0	0	0	0	0	0	0	0	0	703
	ACWP	324	0	0	0	0	0	0	0	0	0	0	0	0	0	0	324

NuMI Project TEC - Labor Only

($000's Omitted)

Program:	Description:	Approval:
NUMITEC	NuMI TEC	Program Manager
Run Date: 10/16/03	Status Date: 9/30/2003	Functional Manager
		Cost Account Manager

DESCRIPTION		PR YRS	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03	APR03	MAY03	JUN03	JUL03	AUG03	SEP03	FY04	FY05	TOTAL
1.3.6 FY 03 Project Management	BCWS	0	48	44	46	48	41	44	46	46	44	48	44	46	0	0	541
	ACWP	0	31	29	22	32	34	41	41	41	33	43	34	35	0	0	416
1.3.7 FY 04 Project Management	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	658	0	658
	ACWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.3.8 FY 05 Project Management	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	330	330
	ACWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WBS[2] Totals:	BCWS	2,800	48	44	46	48	41	44	46	46	44	48	44	46	658	330	4,330
	ACWP	2,077	31	29	22	32	34	41	41	41	33	43	34	35	0	0	2,493
Grand Totals:	BCWS	12,019	317	277	274	289	279	606	307	309	920	360	319	349	3,595	616	20,834
	ACWP	11,656	396	409	166	529	543	1,088	646	570	511	375	396	412	0	0	17,697

NuMI Other Project Costs

($000's Omitted)

Cost Performance Report - Work Breakdown Structure													
Contractor:	Fermi National Accelerator Laboratory				Contract Type/No:			Project Name/No:		Report Period:			
Location:	Batavia							NuMI Other Proj Costs		8/31/03	9/30/03		
Quantity	Negotiated Cost		Est. Cost Authorized Unpriced Work		Tgt. Profit/ Fee %		Tgt. Price	Est Price	Share Ratio	Contract Ceiling	Estimated Contract Ceiling		
1	62,200		0		0	0	62,200	0		0	0		
WBS[2] WBS[3] Results...	Current Period					Cumulative to Date					At Completion		
	Budgeted Cost		Actual Cost	Variance		Budgeted Cost		Actual Cost	Variance			Latest	
Item	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Budgeted	Revised Estimate	Variance
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
2.1 Magnets: Steel & Coils													
2.1.1 Steel Plane Fabrication													
Direct Cost + Escalation	1	0	9	(1)	(9)	4,396	4,397	4,375	1	21	4,397	4,397	0
Indirect Cost	0	0	0	(0)	(0)	232	232	226	0	6	232	232	0
WBS[3]Totals:	1	0	9	(1)	(9)	4,628	4,629	4,601	1	27	4,629	4,629	0
2.1.2 Steel handling fixtures													
Direct Cost + Escalation	0	0	0	0	0	620	620	637	(0)	(17)	620	620	0
Indirect Cost	0	0	0	0	0	153	153	157	0	(3)	153	153	0
WBS[3]Totals:	0	0	0	0	0	773	773	793	0	(20)	773	773	0
2.1.3 Near Detector Support Structures													
Direct Cost + Escalation	0	0	0	0	0	0	0	1	0	(1)	0	0	0
Indirect Cost	0	0	0	0	0	4	4	0	0	4	4	4	0
WBS[3]Totals:	0	0	0	0	0	5	5	1	0	3	5	5	0
2.1.4 Magnet Coil													
Direct Cost + Escalation	0	0	2	0	(2)	1,291	1,291	1,373	(0)	(82)	1,291	1,291	0
Indirect Cost	0	0	(0)	0	0	271	271	300	0	(29)	271	271	0
WBS[3]Totals:	0	0	2	0	(2)	1,562	1,562	1,673	0	(111)	1,562	1,562	0
2.1.5 Detector Plane Prototypes													
Direct Cost + Escalation	0	0	0	0	0	394	394	394	0	0	394	394	0
Indirect Cost	0	0	0	0	0	106	106	102	(0)	5	106	106	0
WBS[3]Totals:	0	0	0	0	0	501	501	496	(0)	5	501	501	0
2.1.6 Steel Management													
Direct Cost + Escalation	0	0	(0)	(0)	0	66	66	52	0	13	66	66	0
Indirect Cost	0	0	0	(0)	(0)	6	6	5	(0)	1	6	6	0
WBS[3]Totals:	0	0	(0)	(0)	0	71	71	57	(0)	14	71	71	0
WBS[2]Totals:	1	0	11	(1)	(11)	7,539	7,540	7,622	1	(81)	7,540	7,540	0
2.2 Scintillator Detector Fabrication													
2.2.1 Scintillator Strips													
Direct Cost + Escalation	0	0	(0)	0	0	2,912	2,912	2,867	0	45	2,912	2,912	0
Indirect Cost	0	0	0	0	(0)	270	270	289	0	(19)	270	270	0
WBS[3]Totals:	0	0	0	0	(0)	3,182	3,182	3,156	0	26	3,182	3,182	0
2.2.2 Fiber													
Direct Cost + Escalation	0	0	0	0	0	4,313	4,313	4,270	0	43	4,313	4,313	0
Indirect Cost	0	0	0	0	0	61	61	26	0	35	61	61	0
WBS[3]Totals:	0	0	0	0	0	4,374	4,374	4,296	0	78	4,374	4,374	0

NuMI Other Project Costs

($000's Omitted)

Cost Performance Report - Work Breakdown Structure													
Contractor:	Fermi National Accelerator Laboratory				Contract Type/No:			Project Name/No:		Report Period:			
Location:	Batavia							NuMI Other Proj Costs		8/31/03	9/30/03		
Quantity	Negotiated Cost		Est. Cost Authorized Unpriced Work		Tgt. Profit/ Fee %		Tgt. Price	Est Price	Share Ratio	Contract Ceiling	Estimated Contract Ceiling		
1	62,200		0		0	0	62,200	0		0	0		
WBS[2] WBS[3] Results...	Current Period					Cumulative to Date					At Completion		
	Budgeted Cost		Actual Cost	Variance		Budgeted Cost		Actual Cost	Variance			Latest	
Item	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Budgeted	Revised Estimate	Variance
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
2.2.3 Scintillator Modules													
Direct Cost + Escalation	0	0	6	0	(6)	1,925	1,925	1,893	0	32	1,925	1,925	0
Indirect Cost	0	0	0	0	(0)	84	84	89	0	(6)	84	84	0
WBS[3]Totals:	0	0	6	0	(6)	2,008	2,008	1,982	0	26	2,008	2,008	0
2.2.4 Photodetector Systems													
Direct Cost + Escalation	3	0	0	(3)	0	2,170	2,175	2,170	5	4	2,175	2,175	0
Indirect Cost	0	0	0	0	0	23	23	9	(0)	14	23	23	0
WBS[3]Totals:	3	0	0	(3)	0	2,193	2,198	2,179	5	19	2,198	2,198	0
2.2.5 Mux Boxes & Connectors													
Direct Cost + Escalation	1	0	0	(1)	0	1,368	1,368	1,397	(0)	(30)	1,368	1,368	0
Indirect Cost	0	0	0	0	0	23	23	23	(0)	(1)	23	23	0
WBS[3]Totals:	1	0	0	(1)	0	1,390	1,390	1,421	(0)	(30)	1,390	1,390	0
2.2.6 Calibration Systems													
Direct Cost + Escalation	0	0	0	0	0	1,105	1,105	1,103	0	3	1,105	1,105	0
Indirect Cost	0	0	0	0	0	1	1	0	0	1	1	1	0
WBS[3]Totals:	0	0	0	0	0	1,106	1,106	1,103	0	3	1,106	1,106	0
2.2.7 Ass'y & Test Equipment													
Direct Cost + Escalation	0	0	0	0	0	1,685	1,685	1,677	(0)	8	1,685	1,685	0
Indirect Cost	0	0	0	0	0	54	54	53	(0)	0	54	54	0
WBS[3]Totals:	0	0	0	0	0	1,739	1,739	1,731	(0)	8	1,739	1,739	0
2.2.8 Factories													
Direct Cost + Escalation	0	0	25	0	(25)	3,142	3,142	3,275	0	(133)	3,142	3,142	0
Indirect Cost	0	0	0	0	(0)	46	46	4	0	42	46	46	0
WBS[3]Totals:	0	0	25	0	(25)	3,188	3,188	3,279	0	(91)	3,188	3,188	0
2.2.9 Scintillator Management													
Direct Cost + Escalation	0	0	0	0	0	348	348	375	(0)	(27)	348	348	0
Indirect Cost	0	0	0	0	0	8	8	5	0	3	8	8	0
WBS[3]Totals:	0	0	0	0	0	355	355	379	0	(24)	355	355	0
WBS[2]Totals:	3	0	32	(3)	(32)	19,535	19,540	19,525	5	15	19,540	19,540	0
2.3 Electronics, DAQ & Database													
2.3.1 Near Detector Front End													
Direct Cost + Escalation	37	76	120	40	(43)	4,122	4,122	3,711	(0)	410	4,262	4,262	0
Indirect Cost	5	17	17	11	(0)	423	437	464	14	(27)	450	450	0
WBS[3]Totals:	42	93	137	51	(44)	4,545	4,559	4,175	14	384	4,712	4,712	0
2.3.2 Far Detector Front-end													
Direct Cost + Escalation	0	0	9	0	(9)	1,579	1,579	1,593	0	(15)	1,579	1,579	0
Indirect Cost	0	0	0	0	(0)	81	81	79	0	2	81	81	0
WBS[3]Totals:	0	0	9	0	(9)	1,660	1,660	1,672	0	(12)	1,660	1,660	0

NuMI Other Project Costs

($000's Omitted)

Cost Performance Report - Work Breakdown Structure													
Contractor:	Fermi National Accelerator Laboratory				Contract Type/No:			Project Name/No:		Report Period:			
Location:	Batavia							NuMI Other Proj Costs		8/31/03	9/30/03		
Quantity	Negotiated Cost		Est. Cost Authorized Unpriced Work		Tgt. Profit/ Fee %		Tgt. Price	Est Price	Share Ratio	Contract Ceiling	Estimated Contract Ceiling		
1	62,200		0		0	0	62,200	0		0	0		
WBS[2] WBS[3] Results...	Current Period					Cumulative to Date					At Completion		
	Budgeted Cost		Actual Cost	Variance		Budgeted Cost		Actual Cost	Variance			Latest	
Item	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Budgeted	Revised Estimate	Variance
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
2.3.3 Data Routing & Trigger Farm													
Direct Cost + Escalation	3	2	2	(0)	(0)	1,210	1,210	1,210	(0)	(0)	1,241	1,241	0
WBS[3]Totals:	3	2	2	(0)	(0)	1,210	1,210	1,210	(0)	(0)	1,241	1,241	0
2.3.4 Data Acquisition & Triggering													
Direct Cost + Escalation	0	0	0	(0)	0	389	389	389	(0)	0	391	391	0
WBS[3]Totals:	0	0	0	(0)	0	389	389	389	(0)	0	391	391	0
2.3.5 Database													
Direct Cost + Escalation	0	0	1	0	(1)	48	48	10	0	38	48	48	0
Indirect Cost	0	0	0	0	0	1	1	0	0	1	1	1	0
WBS[3]Totals:	0	0	1	0	(1)	48	48	10	0	38	48	48	0
2.3.6 Auxilliary Systems													
Direct Cost + Escalation	0	1	3	1	(1)	457	447	489	(10)	(42)	460	460	0
Indirect Cost	0	0	1	(0)	(1)	36	34	48	(2)	(15)	37	37	0
WBS[3]Totals:	0	1	3	1	(2)	492	481	537	(12)	(57)	497	497	0
2.3.7 Electronics Management													
Direct Cost + Escalation	1	0	6	(1)	(6)	143	142	183	(1)	(41)	143	143	0
Indirect Cost	0	0	0	(0)	0	2	2	1	(0)	1	2	2	0
WBS[3]Totals:	1	0	6	(1)	(6)	146	144	184	(1)	(40)	146	146	0
2.3.8 Slow Control & Monitoring													
Direct Cost + Escalation	0	0	23	0	(23)	433	432	361	(0)	72	433	433	0
Indirect Cost	0	0	0	0	(0)	12	12	12	(0)	(0)	12	12	0
WBS[3]Totals:	0	0	23	0	(23)	445	444	373	(0)	71	445	445	0
2.3.9 HV System													
Direct Cost + Escalation	2	0	0	(2)	0	73	74	66	1	7	74	74	0
Indirect Cost	0	0	0	(0)	(0)	9	9	11	0	(2)	9	9	0
WBS[3]Totals:	2	0	0	(2)	(0)	82	83	77	1	6	83	83	0
WBS[2]Totals:	49	97	182	48	(86)	9,017	9,018	8,628	1	391	9,222	9,222	0
2.4 Far Detector Installation													
2.4.1 FDI Completed Design Tasks													
Direct Cost + Escalation	0	0	0	0	0	0	0	0	0	0	0	0	0
Indirect Cost	0	0	0	0	0	0	0	0	0	0	0	0	0
WBS[3]Totals:	0	0	0	0	0	0	0	0	0	0	0	0	0
2.4.2 FDI Management													
Direct Cost + Escalation	0	0	11	0	(11)	631	631	544	0	87	631	631	0
Indirect Cost	0	0	2	0	(2)	30	30	33	(0)	(3)	30	30	0
WBS[3]Totals:	0	0	13	0	(12)	661	661	577	0	84	661	661	0

NuMI Other Project Costs

($000's Omitted)

Cost Performance Report - Work Breakdown Structure													
Contractor:	Fermi National Accelerator Laboratory				Contract Type/No:			Project Name/No:		Report Period:			
Location:	Batavia							NuMI Other Proj Costs		8/31/03	9/30/03		
Quantity	Negotiated Cost		Est. Cost Authorized Unpriced Work		Tgt. Profit/ Fee %		Tgt. Price	Est Price	Share Ratio	Contract Ceiling	Estimated Contract Ceiling		
1	62,200		0		0	0	62,200	0		0	0		
WBS[2]	Current Period					Cumulative to Date					At Completion		
WBS[3]	Budgeted Cost		Actual Cost	Variance		Budgeted Cost		Actual Cost	Variance			Latest	
Results...	Work	Work	Work			Work	Work	Work				Revised	
Item	Scheduled	Performed	Performed	Schedule	Cost	Scheduled	Performed	Performed	Schedule	Cost	Budgeted	Estimate	Variance
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
2.4.3 SDN-FDI Construction Oversight													
Direct Cost + Escalation	0	0	0	0	0	58	58	115	0	(57)	58	58	0
WBS[3]Totals:	0	0	0	0	0	58	58	115	0	(57)	58	58	0
2.4.4 FDI Soudan Lab Infrastructure Setup													
Direct Cost + Escalation	0	0	0	0	0	507	507	469	0	38	507	507	0
Indirect Cost	0	0	0	0	(0)	2	2	4	0	(2)	2	2	0
WBS[3]Totals:	0	0	0	0	(0)	509	509	473	0	36	509	509	0
2.4.5 SDN-FDI Detector Installation													
Direct Cost + Escalation	0	0	694	0	(694)	3,084	3,084	2,753	0	331	3,084	3,084	0
Indirect Cost	0	0	0	0	0	0	0	6	0	(6)	0	0	0
WBS[3]Totals:	0	0	694	0	(694)	3,084	3,084	2,759	0	324	3,084	3,084	0
2.4.6 SDN-FDI DNR Costs													
Direct Cost + Escalation	0	0	0	0	0	708	708	378	0	330	708	708	0
Indirect Cost	0	0	0	0	0	0	0	1	0	(1)	0	0	0
WBS[3]Totals:	0	0	0	0	0	708	708	378	0	329	708	708	0
2.4.7 FDI Alignment & Survey													
Direct Cost + Escalation	0	0	0	0	0	51	51	58	0	(7)	51	51	0
Indirect Cost	0	0	0	0	0	6	6	9	(0)	(3)	6	6	0
WBS[3]Totals:	0	0	0	0	0	57	57	67	(0)	(10)	57	57	0
WBS[2]Totals:	0	0	707	0	(707)	5,077	5,077	4,369	0	707	5,077	5,077	0
2.5 Near Detector Installation													
2.5.1 NDI Infrastructure													
Direct Cost + Escalation	2	12	32	10	(21)	210	175	137	(35)	38	384	384	0
Indirect Cost	1	3	7	2	(4)	52	45	33	(7)	12	104	104	0
WBS[3]Totals:	2	14	39	12	(25)	261	220	170	(41)	50	488	488	0
2.5.2 NDI Plane Assembly													
Direct Cost + Escalation	0	0	(0)	0	0	393	393	403	0	(10)	393	393	0
Indirect Cost	0	0	0	0	(0)	123	123	111	(0)	12	123	123	0
WBS[3]Totals:	0	0	(0)	0	0	516	516	514	0	2	516	516	0
2.5.3 NDI Detector Installation													
Direct Cost + Escalation	2	0	1	(2)	(1)	7	12	33	5	(20)	818	818	0
Indirect Cost	0	0	0	(0)	(0)	2	2	6	1	(4)	213	213	0
WBS[3]Totals:	3	0	1	(3)	(1)	9	15	39	6	(24)	1,031	1,031	0
2.5.4 NDI Facility Experimental Infrastructure													
Direct Cost + Escalation	5	65	77	60	(13)	64	113	105	49	8	133	133	0
Indirect Cost	2	11	13	9	(2)	14	21	19	7	2	26	26	0
WBS[3]Totals:	6	75	90	69	(15)	78	134	124	56	10	160	160	0

NuMI Other Project Costs

($000's Omitted)

Cost Performance Report - Work Breakdown Structure													
Contractor:	Fermi National Accelerator Laboratory				Contract Type/No:			Project Name/No:		Report Period:			
Location:	Batavia							NuMI Other Proj Costs		8/31/03	9/30/03		
Quantity	Negotiated Cost		Est. Cost Authorized Unpriced Work		Tgt. Profit/ Fee %		Tgt. Price	Est Price	Share Ratio	Contract Ceiling	Estimated Contract Ceiling		
1	62,200		0		0	0	62,200	0		0	0		
WBS[2]	Current Period					Cumulative to Date					At Completion		
WBS[3]			Actual					Actual					
Results...	Budgeted Cost		Cost	Variance		Budgeted Cost		Cost	Variance			Latest	
Item	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Budgeted	Revised Estimate	Variance
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
2.5.5 RBI SB&O Experimental Systems Outfitting													
Direct Cost + Escalation	187	51	13	(136)	38	2,341	2,002	1,957	(340)	44	2,559	2,559	0
WBS[3]Totals:	187	51	13	(136)	38	2,341	2,002	1,957	(340)	44	2,559	2,559	0
WBS[2]Totals:	198	140	143	(58)	(3)	3,206	2,886	2,805	(320)	82	4,753	4,753	0
2.6 MINOS Project Management													
2.6.1 FNL-Project Management													
Direct Cost + Escalation	16	16	15	(0)	1	1,103	1,103	1,180	0	(77)	1,103	1,103	0
Indirect Cost	5	5	5	(0)	0	345	345	326	(0)	19	345	345	0
WBS[3]Totals:	21	21	20	(1)	1	1,448	1,448	1,505	0	(58)	1,448	1,448	0
2.6.2 ANL-Project Management													
Direct Cost + Escalation	0	0	0	0	0	96	96	96	0	(0)	96	96	0
Indirect Cost	0	0	0	0	0	1	1	1	0	0	1	1	0
WBS[3]Totals:	0	0	0	0	0	98	98	98	0	(0)	98	98	0
WBS[2]Totals:	21	21	20	(1)	1	1,546	1,546	1,603	0	(58)	1,546	1,546	0
3.1 NuMI Conceptual Design													
3.1.1 FNL-BD-NuMI CDR													
Direct Cost + Escalation	0	0	0	0	0	407	407	407	0	0	407	407	0
Indirect Cost	0	0	0	0	0	82	82	80	0	2	82	82	0
WBS[3]Totals:	0	0	0	0	0	489	489	487	0	2	489	489	0
3.1.2 FNL-BD-NuMI FESS CDR													
Direct Cost + Escalation	0	0	0	0	0	282	282	282	0	0	282	282	0
Indirect Cost	0	0	0	0	0	64	64	64	0	0	64	64	0
WBS[3]Totals:	0	0	0	0	0	346	346	346	0	0	346	346	0
3.1.3 FNL-NuMI Beam Design													
Direct Cost + Escalation	0	0	0	0	0	612	612	612	0	(0)	612	612	0
Indirect Cost	0	0	0	0	0	186	186	184	0	3	186	186	0
WBS[3]Totals:	0	0	0	0	0	798	798	796	0	3	798	798	0
3.1.4 FNL-BD-NuMI Project Management													
Direct Cost + Escalation	0	0	0	0	0	184	184	184	0	(0)	184	184	0
Indirect Cost	0	0	0	0	0	51	51	50	0	1	51	51	0
WBS[3]Totals:	0	0	0	0	0	235	235	234	0	1	235	235	0
3.1.5 FNL-Soudan Lab Design													
Direct Cost + Escalation	0	0	0	0	0	55	55	56	0	(1)	55	55	0
Indirect Cost	0	1	0	1	1	10	10	9	0	1	10	10	0
WBS[3]Totals:	0	1	0	1	1	65	65	65	0	0	65	65	0
WBS[2]Totals:	0	1	0	1	1	1,934	1,934	1,928	0	6	1,934	1,934	0

NuMI Other Project Costs

($000's Omitted)

Cost Performance Report - Work Breakdown Structure													
Contractor:	Fermi National Accelerator Laboratory				Contract Type/No:			Project Name/No:		Report Period:			
Location:	Batavia							NuMI Other Proj Costs		8/31/03	9/30/03		
Quantity	Negotiated Cost		Est. Cost Authorized Unpriced Work		Tgt. Profit/ Fee %		Tgt. Price	Est Price	Share Ratio	Contract Ceiling	Estimated Contract Ceiling		
1	62,200		0		0	0	62,200	0		0	0		
WBS[2] WBS[3] Results...	Current Period					Cumulative to Date					At Completion		
	Budgeted Cost		Actual Cost	Variance		Budgeted Cost		Actual Cost	Variance			Latest	
Item	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Budgeted	Revised Estimate	Variance
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
3.2 MINOS Detector R&D													
3.2.1 FNL-MINOS Scintillator R&D													
Direct Cost + Escalation	0	0	0	0	0	879	879	870	0	9	879	879	0
Indirect Cost	0	0	0	0	0	116	116	118	0	(1)	116	116	0
WBS[3]Totals:	0	0	0	0	0	995	995	988	0	8	995	995	0
3.2.2 FNL-MINOS Steel R&D													
Direct Cost + Escalation	0	0	0	0	0	553	553	550	0	2	553	553	0
Indirect Cost	0	0	0	0	0	96	96	94	0	2	96	96	0
WBS[3]Totals:	0	0	0	0	0	649	649	644	0	4	649	649	0
3.2.3 FNL-RD-Neutrino Oscillation R&D													
Direct Cost + Escalation	0	0	0	0	0	116	116	116	0	0	116	116	0
Indirect Cost	0	0	0	0	0	20	20	20	(0)	0	20	20	0
WBS[3]Totals:	0	0	0	0	0	136	136	136	(0)	0	136	136	0
WBS[2]Totals:	0	0	0	0	0	1,780	1,780	1,768	(0)	12	1,780	1,780	0
3.3 MINOS Cavern													
3.3.0 Preconstruction Work													
Direct Cost + Escalation	0	0	0	0	0	758	758	758	0	0	758	758	0
WBS[3]Totals:	0	0	0	0	0	758	758	758	0	0	758	758	0
3.3.1 Cavern Construction													
Direct Cost + Escalation	0	0	0	0	0	6,597	6,597	6,597	0	0	6,597	6,597	0
WBS[3]Totals:	0	0	0	0	0	6,597	6,597	6,597	0	0	6,597	6,597	0
3.3.2 Cavern Outfitting													
Direct Cost + Escalation	0	0	0	0	0	7,171	7,171	7,171	0	0	7,171	7,171	0
WBS[3]Totals:	0	0	0	0	0	7,171	7,171	7,171	0	0	7,171	7,171	0
WBS[2]Totals:	0	0	0	0	0	14,527	14,527	14,527	0	0	14,527	14,527	0
3.4 Soudan/MINOS Operating													
3.4.1 UMN-Mine Crew Support/Soudan Gen'l Operations													
Direct Cost + Escalation	20	21	0	0	21	1,702	1,702	1,503	(0)	198	1,702	1,702	0
Indirect Cost	0	0	0	0	0	8	8	27	0	(20)	8	8	0
WBS[3]Totals:	20	21	0	0	21	1,709	1,709	1,531	(0)	178	1,709	1,709	0
3.4.2 UMN-Breitung Township Building Rental													
Direct Cost + Escalation	0	0	0	0	0	114	114	75	0	39	114	114	0
WBS[3]Totals:	0	0	0	0	0	114	114	75	0	39	114	114	0

NuMI Other Project Costs

($000's Omitted)

Cost Performance Report - Work Breakdown Structure													
Contractor:	Fermi National Accelerator Laboratory				Contract Type/No:			Project Name/No:		Report Period:			
Location:	Batavia							NuMI Other Proj Costs		8/31/03		9/30/03	
Quantity	Negotiated Cost		Est. Cost Authorized Unpriced Work		Tgt. Profit/ Fee %		Tgt. Price	Est Price	Share Ratio	Contract Ceiling	Estimated Contract Ceiling		
1	62,200		0		0	0	62,200	0		0	0		
WBS[2]	Current Period					Cumulative to Date					At Completion		
WBS[3] Results...	Budgeted Cost		Actual Cost	Variance		Budgeted Cost		Actual Cost	Variance			Latest	
Item	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Work Scheduled	Work Performed	Work Performed	Schedule	Cost	Budgeted	Revised Estimate	Variance
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
3.4.3 UMN-E Peterson Salary													
Direct Cost + Escalation	0	0	0	0	0	73	73	71	0	2	73	73	0
WBS[3]Totals:	0	0	0	0	0	73	73	71	0	2	73	73	0
WBS[2]Totals:	20	21	0	0	21	1,896	1,896	1,677	(0)	219	1,896	1,896	0
General and Administrative	0	0	0	0	0	0	0	0	0	0	0	0	0
Undistributed Budget											0	0	0
Sub Total	293	280	1,094	(14)	(814)	66,056	65,744	64,452	(313)	1,292	67,815	67,815	0
Contingency + MINOS Scope Reserve											3,414	3,414	0
Total NuMI Other Proj Costs	293	280	1,094	(14)	(814)	66,056	65,744	64,452	(313)	1,292	71,230	71,230	0
UK In-Kind Contribution	(6)	(4)	(4)	3	0	(4,797)	(4,801)	(4,801)	(4)	0	(5,272)	(5,272)	0
Minnesota Preconstruction Funds	0	0	0	0	0	(758)	(758)	(758)	0	0	(758)	(758)	0
Minnesota Construction Funds FY99	0	0	0	0	0	(3,000)	(3,000)	(3,000)	0	0	(3,000)	(3,000)	0
Total US Funds	287	276	1,091	(11)	(814)	57,501	57,185	55,893	(317)	1,292	62,200	62,200	0
WBS[2}Totals:													
Direct Cost + Escalation	259	223	1,050	(37)	(828)	43,440	43,114	42,100	(326)	1,014	44,895	44,895	0
Indirect Cost	14	35	44	21	(9)	2,479	2,493	2,452	13	41	2,784	2,784	0
Subtotal	273	258	1,094	(15)	(836)	45,920	45,607	44,552	(313)	1,055	47,679	47,679	0
UK In-Kind Contribution	(6)	(4)	(4)	3	0	(4,797)	(4,801)	(4,801)	(4)	0	(5,272)	(5,272)	0
Total MINOS Detector	267	254	1,091	(12)	(836)	41,123	40,806	39,751	(317)	1,055	42,407	42,407	0
Direct Cost + Escalation	20	21	0	0	21	19,502	19,502	19,253	(0)	249	19,502	19,502	0
Indirect Cost	0	1	0	1	1	634	634	646	0	(12)	634	634	0
Subtotal	20	22	0	2	22	20,136	20,136	19,900	0	237	20,136	20,136	0
Minnesota Preconstruction Funds	0	0	0	0	0	(758)	(758)	(758)	0	0	(758)	(758)	0
Minnesota Construction Funds FY99	0	0	0	0	0	(3,000)	(3,000)	(3,000)	0	0	(3,000)	(3,000)	0
Total Project Support	20	22	0	2	22	16,378	16,378	16,142	0	237	16,378	16,378	0
Contingency + MINOS Scope Reserve											3,414	3,414	0
Total US Funds	287	276	1,091	(11)	(814)	57,501	57,185	55,893	(317)	1,292	62,200	62,200	0

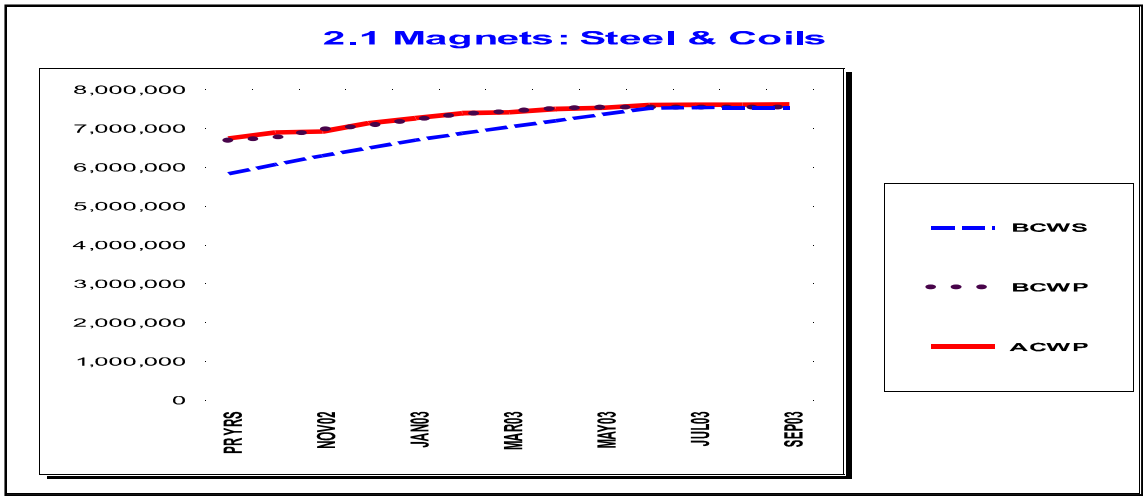
NuMI Other Project Costs

($000's Omitted)

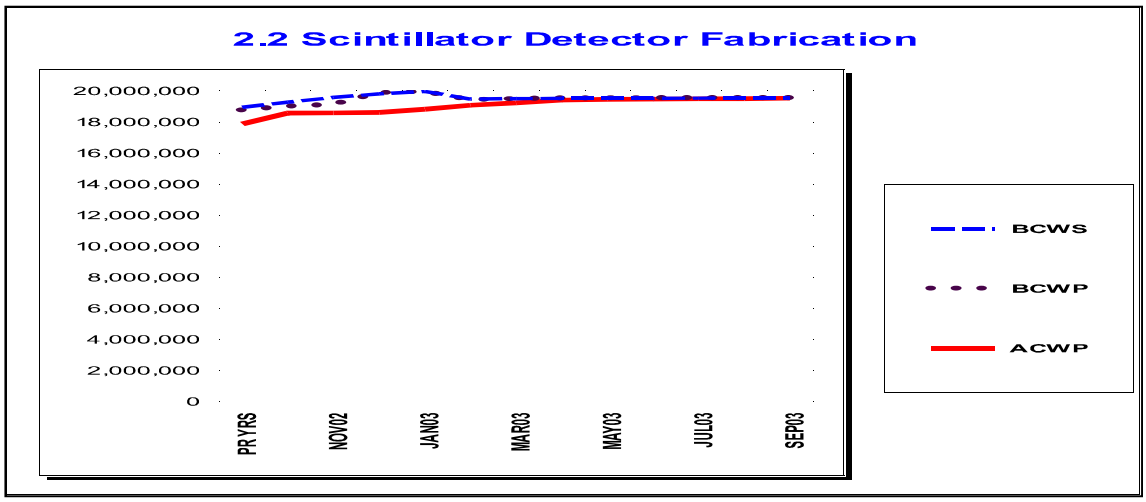
Cost Performance Report - Baseline																
Contractor:	Fermi National Accelerator Laboratory			Contract Type/No:		Project Name/No:			Report Period:							
Location:	Batavia					NuMI Other Proj Costs			8/31/03	9/30/03						
(1) Original Contract Target Cost		(2) Negotiated Contract Changes		(3) Current Target Cost		(4) Est. Cost Authorized Authorized Unpriced Work			(5) Contract Budget Base (3) + (4)					(6) Total Allocated Budget		(7) Difference (5) - (6)
62,200		0		62,200		0			62,200					62,200		0
(8) Contract Start Date 10/1/97		(9) Contract Definitization Date 10/1/97				(10) Last Item Delivery Date 4/30/04			(11) Contract Completion Date 4/30/04					(12)Estimated Completion Date 4/30/04		
Item	BCWS Cum to Date	BCWS for Report Period	Budgeted Cost for Work Scheduled (Non-Cumulative) Six Month Forecast +1 OCT03	+2 NOV03	+3 DEC03	+4 JAN04	+5 FEB04	+6 MAR04	(Enter Specific Periods) BAL FY04	FY05				Undist Budget	Total Budget
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
PM Baseline (Beginning of Period)	65,762	293	209	133	329	158	123	109	626	37	0	0	0	0	67,778
143, 144 Indirect Rate Revisions															0
162 WBS 2.2 Schedule/Budget Revisions															1
244 Add Change Orders to RBI Budget															36
PM Baseline (End of Period)	66,056		218	141	338	167	123	109	626	37	0	0	0	0	67,815
Contingency															3,414
Total															71,230
UK In-Kind Contribution															(5,272)
Minnesota Preconstruction Funds															(758)
Minnesota Preconstruction Funds FY99															(3,000)
Total US Funds															62,200

NuMI Other Project Costs

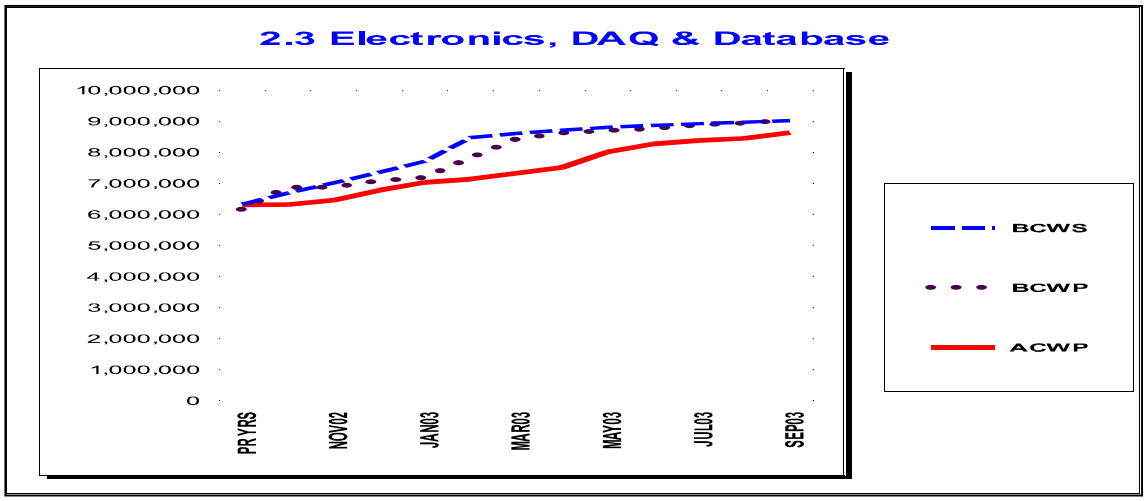
($000's Omitted)



	PR YRS	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03	APR03	MAY03	JUN03	JUL03	AUG03	SEP03
BCWS	5,831	6,069	6,296	6,498	6,698	6,873	7,038	7,197	7,361	7,519	7,537	7,538	7,539
BCWP	6,687	6,754	6,969	7,066	7,219	7,363	7,433	7,510	7,536	7,538	7,539	7,540	7,540
ACWP	6,743	6,894	6,921	7,137	7,263	7,393	7,413	7,501	7,532	7,603	7,610	7,611	7,622



	PR YRS	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03	APR03	MAY03	JUN03	JUL03	AUG03	SEP03
BCWS	18,941	19,270	19,573	19,801	19,963	19,466	19,501	19,511	19,516	19,522	19,527	19,532	19,535
BCWP	18,752	18,992	19,098	19,863	19,941	19,408	19,481	19,516	19,529	19,534	19,535	19,540	19,540
ACWP	17,860	18,569	18,576	18,613	18,815	19,077	19,224	19,399	19,457	19,466	19,488	19,494	19,525

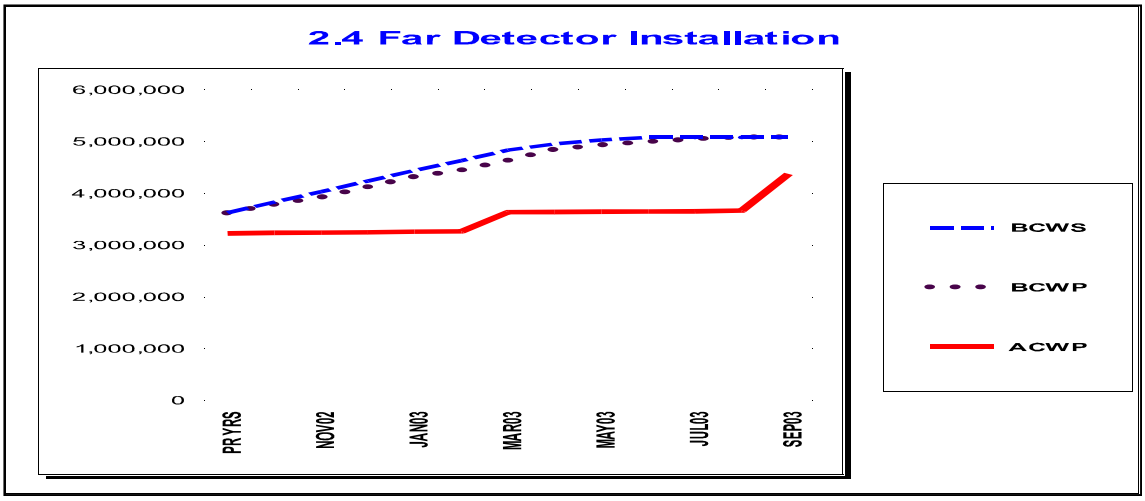


	PR YRS	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03	APR03	MAY03	JUN03	JUL03	AUG03	SEP03
BCWS	6,323	6,682	7,010	7,352	7,708	8,469	8,603	8,704	8,798	8,861	8,917	8,968	9,017
BCWP	6,147	6,857	6,857	7,067	7,167	7,799	8,398	8,604	8,681	8,745	8,864	8,921	9,018
ACWP	6,307	6,314	6,452	6,774	7,028	7,132	7,318	7,509	8,005	8,265	8,377	8,445	8,628

NuMI Other Project Costs

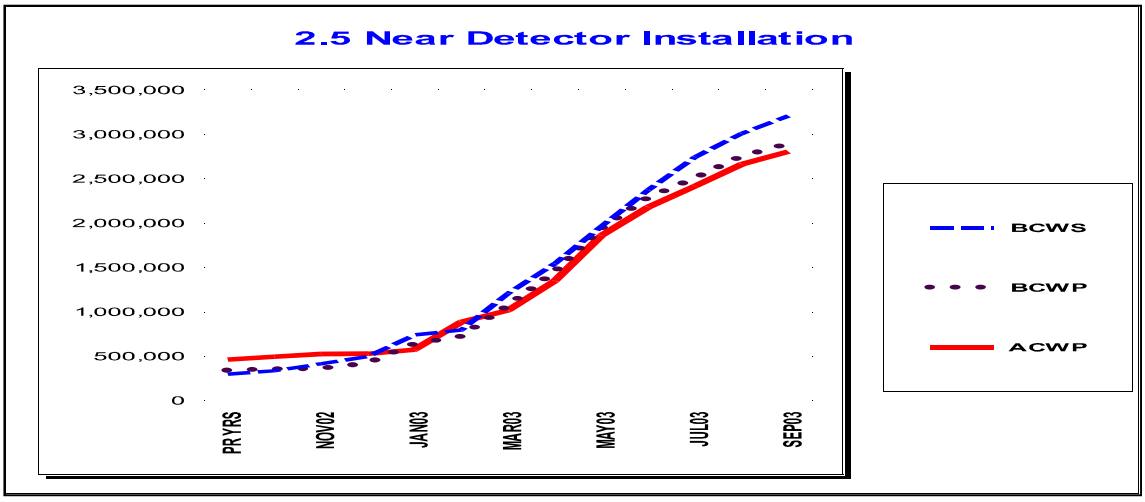
($000's Omitted)

2.4 Far Detector Installation



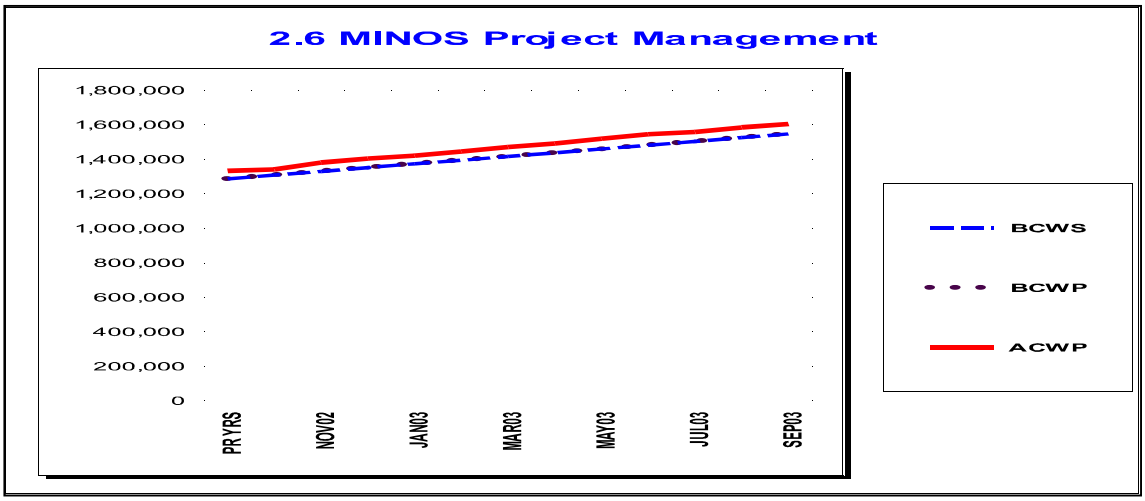
	PR YRS	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03	APR03	MAY03	JUN03	JUL03	AUG03	SEP03
BCWS	3,621	3,827	4,027	4,233	4,439	4,626	4,832	4,949	5,026	5,077	5,077	5,077	5,077
BCWP	3,612	3,779	3,912	4,112	4,312	4,436	4,624	4,840	4,926	4,987	5,041	5,076	5,077
ACWP	3,221	3,233	3,238	3,242	3,254	3,260	3,632	3,634	3,642	3,644	3,647	3,662	4,369

2.5 Near Detector Installation



	PR YRS	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03	APR03	MAY03	JUN03	JUL03	AUG03	SEP03
BCWS	295	334	413	495	738	793	1,205	1,541	1,963	2,371	2,742	3,007	3,206
BCWP	336	351	358	415	634	717	1,060	1,440	1,930	2,278	2,499	2,746	2,886
ACWP	460	492	524	526	572	885	1,015	1,348	1,859	2,179	2,415	2,661	2,805

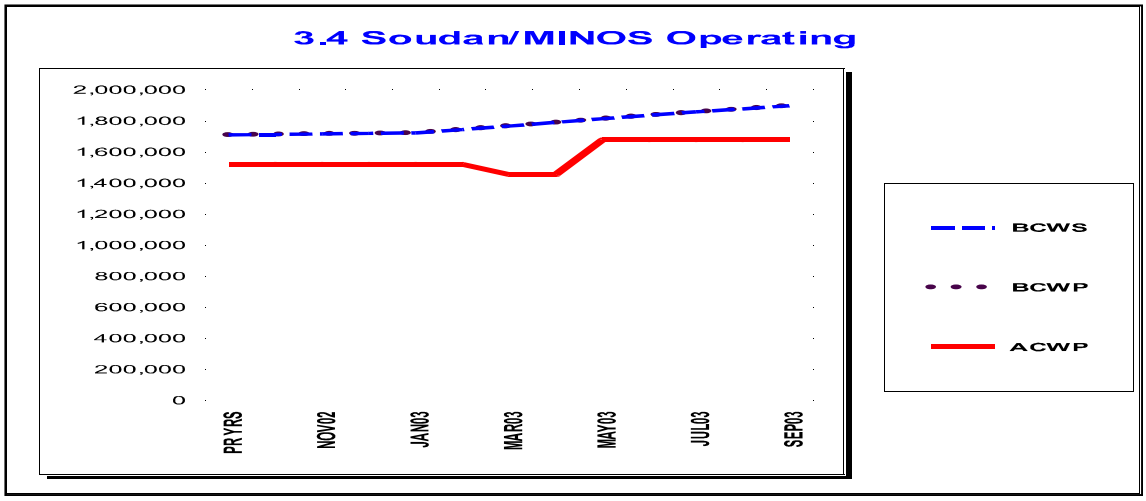
2.6 MINOS Project Management



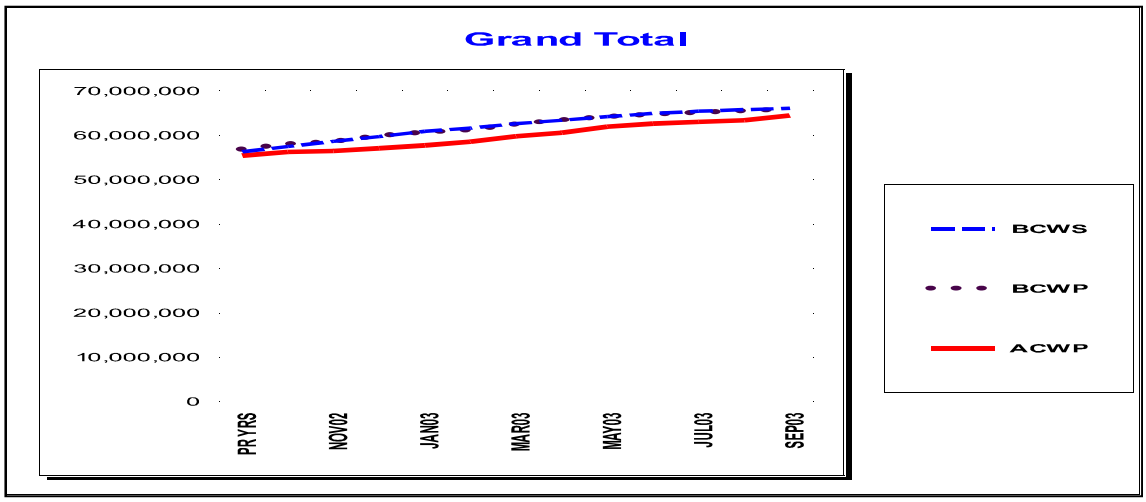
	PR YRS	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03	APR03	MAY03	JUN03	JUL03	AUG03	SEP03
BCWS	1,285	1,307	1,329	1,351	1,373	1,393	1,415	1,436	1,459	1,480	1,502	1,524	1,546
BCWP	1,285	1,307	1,329	1,351	1,373	1,393	1,415	1,436	1,457	1,480	1,501	1,525	1,546
ACWP	1,331	1,341	1,380	1,403	1,420	1,443	1,469	1,490	1,518	1,544	1,557	1,584	1,603

NuMI Other Project Costs

($000's Omitted)



	PR YRS	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03	APR03	MAY03	JUN03	JUL03	AUG03	SEP03
BCWS	1,708	1,711	1,714	1,718	1,721	1,743	1,765	1,789	1,813	1,835	1,856	1,876	1,896
BCWP	1,708	1,711	1,715	1,717	1,721	1,742	1,766	1,787	1,812	1,834	1,855	1,876	1,896
ACWP	1,519	1,519	1,519	1,519	1,519	1,519	1,452	1,452	1,677	1,677	1,677	1,677	1,677



	PR YRS	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03	APR03	MAY03	JUN03	JUL03	AUG03	SEP03
BCWS	56,245	57,442	58,603	59,688	60,880	61,603	62,600	63,367	64,175	64,905	65,399	65,763	66,056
BCWP	56,767	57,990	58,476	59,829	60,606	61,096	62,416	63,372	64,110	64,636	65,073	65,464	65,744
ACWP	55,386	56,211	56,454	57,059	57,712	58,549	59,747	60,557	61,913	62,600	62,994	63,358	64,452

NuMI Other Project Costs - US Funds

($000's Omitted)

Program:	Description:	Approval:
NUMIOPC	NuMI Other Proj Costs	Program Manager
Run Date: 10/16/03	Status Date: 9/30/2003	Functional Manager
		Cost Account Manager

DESCRIPTION		PR YRS	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03	APR03	MAY03	JUN03	JUL03	AUG03	SEP03	FY04	FY05	TOTAL
2.1 Magnets: Steel & Coils																	
2.1.1 Steel Plane Fabrication	BCWS	3,100	200	189	164	164	148	164	158	164	158	18	1	1	1	0	4,629
	ACWP	3,740	145	22	220	120	130	20	86	30	71	7	0	9	0	0	4,601
2.1.2 Steel handling fixtures	BCWS	773	0	0	0	0	0	0	0	0	0	0	0	0	0	0	773
	ACWP	793	0	0	0	0	0	0	0	0	0	0	0	0	0	0	793
2.1.3 Near Detector Support Structures	BCWS	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	5
	ACWP	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2.1.4 Magnet Coil	BCWS	1,388	37	36	37	35	27	1	0	0	0	0	0	0	0	0	1,562
	ACWP	1,657	6	6	-4	3	0	0	2	0	0	0	0	2	0	0	1,673
2.1.5 Detector Plane Prototypes	BCWS	501	0	0	0	0	0	0	0	0	0	0	0	0	0	0	501
	ACWP	496	0	0	0	0	0	0	0	0	0	0	0	0	0	0	496
2.1.6 Steel Management	BCWS	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71
	ACWP	55	0	0	0	1	0	0	0	0	0	0	1	0	0	0	57
WBS[2] Totals:	BCWS	5,831	238	227	202	200	175	165	159	164	159	18	1	1	1	0	7,540
	ACWP	6,743	151	27	216	125	130	21	88	30	71	7	1	11	0	0	7,622
2.2 Scintillator Detector Fabrication																	
2.2.1 Scintillator Strips	BCWS	2,987	62	57	6	0	-115	0	0	0	0	0	0	0	0	0	2,998
	ACWP	2,888	4	43	8	24	3	1	0	0	0	0	0	0	0	0	2,972
2.2.2 Fiber	BCWS	4,140	9	6	6	6	-129	0	0	0	0	0	0	0	0	0	4,039
	ACWP	3,300	418	-64	5	36	79	94	51	23	0	18	1	0	0	0	3,961
2.2.3 Scintillator Modules	BCWS	1,963	1	1	1	1	42	0	0	0	0	0	0	0	0	0	2,008
	ACWP	1,951	2	0	0	0	0	0	19	4	0	0	0	6	0	0	1,982
2.2.4 Photodetector Systems	BCWS	1,694	45	48	24	4	-95	0	0	0	0	0	0	0	0	0	1,720
	ACWP	1,570	56	0	17	13	11	0	33	0	0	0	0	0	0	0	1,702
2.2.5 Mux Boxes & Connectors	BCWS	1,014	23	19	14	6	-21	1	1	1	1	1	1	0	0	0	1,063
	ACWP	1,043	15	0	15	7	7	0	3	2	0	0	0	0	0	0	1,093
2.2.6 Calibration Systems	BCWS	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
	ACWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.2.7 Ass'y & Test Equipment	BCWS	1,729	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,729
	ACWP	1,721	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,721
2.2.8 Factories	BCWS	2,929	120	116	120	95	-219	24	3	0	0	0	0	0	0	0	3,188
	ACWP	2,815	149	10	-15	89	135	26	43	0	0	2	0	25	0	0	3,279
2.2.9 Scintillator Management	BCWS	347	2	2	2	2	2	0	0	0	0	0	0	0	0	0	355
	ACWP	351	0	2	2	5	0	0	0	16	4	0	0	0	0	0	379
WBS[2] Totals:	BCWS	16,806	262	248	173	113	-535	26	5	1	1	1	1	0	0	0	17,104
	ACWP	15,639	643	-8	32	175	236	121	150	45	5	20	1	32	0	0	17,089
2.3 Electronics, DAQ & Database																	
2.3.1 Near Detector Front End	BCWS	2,460	314	287	300	314	468	95	64	63	44	48	44	42	161	5	4,712
	ACWP	2,291	-31	88	308	198	62	104	164	488	257	45	62	137	0	0	4,175
2.3.2 Far Detector Front-end	BCWS	929	0	0	0	0	255	0	0	0	0	0	0	0	0	0	1,184
	ACWP	1,184	0	0	0	0	4	0	0	0	0	0	0	9	0	0	1,197
2.3.5 Database	BCWS	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48
	ACWP	8	0	0	0	0	1	0	0	0	0	0	0	1	0	0	10
2.3.6 Auxilliary Systems	BCWS	133	10	9	9	10	8	9	9	2	1	0	0	0	5	0	206
	ACWP	170	3	50	-12	11	7	2	3	4	0	5	3	2	0	0	247

NuMI Other Project Costs - US Funds

($000's Omitted)

Program:	Description:	Approval:
NUMIOPC	NuMI Other Proj Costs	Program Manager
Run Date: 10/16/03	Status Date: 9/30/2003	Functional Manager
		Cost Account Manager

DESCRIPTION		PR YRS	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03	APR03	MAY03	JUN03	JUL03	AUG03	SEP03	FY04	FY05	TOTAL
2.3.7 Electronics Management	BCWS	93	6	5	5	6	5	5	5	5	4	2	2	1	0	0	146
	ACWP	102	0	0	0	44	0	0	23	0	0	10	0	6	0	0	184
2.3.8 Slow Control & Monitoring	BCWS	324	15	14	14	15	13	14	14	14	7	0	0	0	0	0	445
	ACWP	195	0	0	0	0	28	77	0	0	0	49	0	23	0	0	373
2.3.9 HV System	BCWS	57	3	3	2	2	2	2	2	2	2	2	2	2	1	0	83
	ACWP	71	5	0	1	0	0	0	0	0	0	0	0	0	0	0	77
WBS[2] Totals:	BCWS	4,045	347	317	331	346	751	125	95	88	59	53	48	46	167	5	6,824
	ACWP	4,021	-22	139	296	252	102	183	190	492	257	109	66	179	0	0	6,263
2.4 Far Detector Installation																	
2.4.1 FDI Completed Design Tasks	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ACWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.4.2 FDI Management	BCWS	470	22	22	22	22	21	22	22	22	15	0	0	0	0	0	661
	ACWP	498	12	5	4	12	5	-3	2	8	1	3	15	13	0	0	577
2.4.3 SDN-FDI Construction Oversight	BCWS	58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58
	ACWP	115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	115
2.4.4 FDI Soudan Lab Infrastructure Setup	BCWS	509	0	0	0	0	0	0	0	0	0	0	0	0	0	0	509
	ACWP	475	0	0	0	1	0	-2	0	0	0	0	0	0	0	0	473
2.4.5 SDN-FDI Detector Installation	BCWS	2,062	148	143	148	148	134	148	78	46	30	0	0	0	0	0	3,084
	ACWP	1,688	0	0	0	0	0	377	0	0	0	0	0	694	0	0	2,759
2.4.6 SDN-FDI DNR Costs	BCWS	465	36	35	36	36	32	36	18	9	6	0	0	0	0	0	708
	ACWP	378	0	0	0	0	0	0	0	0	0	0	0	0	0	0	378
2.4.7 FDI Alignment & Survey	BCWS	57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57
	ACWP	67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67
WBS[2] Totals:	BCWS	3,621	206	200	206	206	187	206	117	77	51	0	0	0	0	0	5,077
	ACWP	3,221	12	5	4	13	5	372	2	8	1	3	15	707	0	0	4,369
2.5 Near Detector Installation																	
2.5.1 NDI Infrastructure	BCWS	55	12	11	12	12	11	57	34	18	11	19	7	2	226	0	488
	ACWP	43	0	9	1	2	11	2	14	5	11	14	20	39	0	0	170
2.5.2 NDI Plane Assembly	BCWS	240	27	67	11	0	0	171	0	0	0	0	0	0	0	0	516
	ACWP	413	32	22	2	41	2	0	0	5	0	0	-5	0	0	0	514
2.5.3 NDI Detector Installation	BCWS	0	0	0	0	0	0	1	1	1	1	1	3	3	990	32	1,031
	ACWP	4	0	1	0	3	3	7	4	6	3	2	6	1	0	0	39
2.5.4 NDI Facility Experimental Infrastructure	BCWS	0	0	0	0	0	0	0	1	0	55	10	6	6	82	0	160
	ACWP	0	0	0	0	0	0	0	0	0	0	8	26	90	0	0	124
2.5.5 RBI SB&O Experimental Systems Outfitting	BCWS	0	0	0	60	230	44	184	300	404	341	341	251	187	218	0	2,559
	ACWP	0	0	0	0	0	296	122	315	495	306	212	199	13	0	0	1,957
WBS[2] Totals:	BCWS	295	39	79	82	242	55	413	335	422	408	371	266	198	1,516	32	4,753
	ACWP	460	32	32	3	46	312	131	333	511	320	237	246	143	0	0	2,805
2.6 MINOS Project Management																	
2.6.1 FNL-Project Management	BCWS	1,187	22	21	22	22	20	22	21	22	21	22	22	21	0	0	1,448
	ACWP	1,234	9	39	23	17	24	26	21	27	26	13	26	20	0	0	1,505
2.6.2 ANL-Project Management	BCWS	98	0	0	0	0	0	0	0	0	0	0	0	0	0	0	98
	ACWP	98	0	0	0	0	0	0	0	0	0	0	0	0	0	0	98
WBS[2] Totals:	BCWS	1,285	22	21	22	22	20	22	21	22	21	22	22	21	0	0	1,546
	ACWP	1,331	9	39	23	17	24	26	21	27	26	13	26	20	0	0	1,603

NuMI Other Project Costs - US Funds

($000's Omitted)

Program:	Description:	Approval:
NUMIOPC	NuMI Other Proj Costs	Program Manager
Run Date: 10/16/03	Status Date: 9/30/2003	Functional Manager
		Cost Account Manager

DESCRIPTION		PR YRS	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03	APR03	MAY03	JUN03	JUL03	AUG03	SEP03	FY04	FY05	TOTAL
3.1 NuMI Conceptual Design																	
3.1.1 FNL-BD-NuMI CDR	BCWS	489	0	0	0	0	0	0	0	0	0	0	0	0	0	0	489
	ACWP	487	0	0	0	0	0	0	0	0	0	0	0	0	0	0	487
3.1.2 FNL-BD-NuMI FESS CDR	BCWS	346	0	0	0	0	0	0	0	0	0	0	0	0	0	0	346
	ACWP	346	0	0	0	0	0	0	0	0	0	0	0	0	0	0	346
3.1.3 FNL-NuMI Beam Design	BCWS	798	0	0	0	0	0	0	0	0	0	0	0	0	0	0	798
	ACWP	796	0	0	0	0	0	0	0	0	0	0	0	0	0	0	796
3.1.4 FNL-BD-NuMI Project Management	BCWS	235	0	0	0	0	0	0	0	0	0	0	0	0	0	0	235
	ACWP	234	0	0	0	0	0	0	0	0	0	0	0	0	0	0	234
3.1.5 FNL-Soudan Lab Design	BCWS	65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65
	ACWP	65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65
WBS[2] Totals:	BCWS	1,934	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,934
	ACWP	1,928	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,928
3.2 MINOS Detector R&D																	
3.2.1 FNL-MINOS Scintillator R&D	BCWS	995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	995
	ACWP	988	0	0	0	0	0	0	0	0	0	0	0	0	0	0	988
3.2.2 FNL-MINOS Steel R&D	BCWS	649	0	0	0	0	0	0	0	0	0	0	0	0	0	0	649
	ACWP	644	0	0	0	0	0	0	0	0	0	0	0	0	0	0	644
3.2.3 FNL-RD-Neutrino Oscillation R&D	BCWS	136	0	0	0	0	0	0	0	0	0	0	0	0	0	0	136
	ACWP	136	0	0	0	0	0	0	0	0	0	0	0	0	0	0	136
WBS[2] Totals:	BCWS	1,780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,780
	ACWP	1,768	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,768
3.3 MINOS Cavern																	
3.3.0 Preconstruction Work	BCWS	758	0	0	0	0	0	0	0	0	0	0	0	0	0	0	758
	ACWP	758	0	0	0	0	0	0	0	0	0	0	0	0	0	0	758
3.3.1 Cavern Construction	BCWS	6,597	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,597
	ACWP	6,442	1	0	0	0	0	154	0	0	0	0	0	0	0	0	6,597
3.3.2 Cavern Outfitting	BCWS	7,171	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7,171
	ACWP	7,049	-96	-5	0	-3	0	227	0	0	0	0	0	0	0	0	7,171
WBS[2] Totals:	BCWS	14,527	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14,527
	ACWP	14,249	-95	-5	0	-3	0	381	0	0	0	0	0	0	0	0	14,527
3.4 Soudan/MINOS Operating																	
3.4.1 UMN-Mine Crew Support/Soudan Gen'l Operations	BCWS	1,550	0	0	0	0	18	19	20	20	19	21	19	20	0	0	1,709
	ACWP	1,372	0	0	0	0	0	-66	0	225	0	0	0	0	0	0	1,531
3.4.2 UMN-Breitung Township Building Rental	BCWS	85	3	3	3	3	3	3	3	3	3	0	0	0	0	0	114
	ACWP	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
3.4.3 UMN-E Peterson Salary	BCWS	73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73
	ACWP	72	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	71
WBS[2] Totals:	BCWS	1,708	3	3	3	3	22	23	24	24	23	21	19	20	0	0	1,896
	ACWP	1,519	0	0	0	0	0	-66	0	225	0	0	0	0	0	0	1,677
Grand Totals:	BCWS	51,832	1,118	1,095	1,021	1,133	675	979	756	798	721	486	357	287	1,684	37	62,980
	ACWP	50,878	731	228	575	624	809	1,167	784	1,339	680	390	355	1,091	0	0	59,651

NuMI Other Project Costs - US Funds - Labor Only

($000's Omitted)

Program:	Description:	Approval:
NUMIOPC	NuMI Other Proj Costs	Program Manager
Run Date: 10/16/03	Status Date: 9/30/2003	Functional Manager
		Cost Account Manager

DESCRIPTION		PR YRS	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03	APR03	MAY03	JUN03	JUL03	AUG03	SEP03	FY04	FY05	TOTAL
2.1 Magnets: Steel & Coils																	
2.1.1 Steel Plane Fabrication	BCWS	127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	130
	ACWP	142	15	3	0	0	2	2	0	2	0	5	0	0	0	0	171
2.1.2 Steel handling fixtures	BCWS	437	0	0	0	0	0	0	0	0	0	0	0	0	0	0	437
	ACWP	532	0	0	0	0	0	28	0	0	0	0	0	0	0	0	560
2.1.3 Near Detector Support Structures	BCWS	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36
	ACWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.1.4 Magnet Coil	BCWS	564	0	0	0	0	0	0	0	0	0	0	0	0	0	0	564
	ACWP	784	2	6	0	0	0	47	0	0	0	0	0	0	0	0	839
2.1.5 Detector Plane Prototypes	BCWS	355	0	0	0	0	0	0	0	0	0	0	0	0	0	0	355
	ACWP	303	0	0	0	0	0	72	0	0	0	0	0	0	0	0	375
2.1.6 Steel Management	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ACWP	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
WBS[2] Totals:	BCWS	1,518	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,522
	ACWP	1,762	17	9	0	1	2	149	0	2	0	5	0	0	0	0	1,946
2.2 Scintillator Detector Fabrication																	
2.2.1 Scintillator Strips	BCWS	111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	111
	ACWP	324	2	4	0	6	0	8	0	0	0	0	0	0	0	0	344
2.2.2 Fiber	BCWS	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
	ACWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.2.3 Scintillator Modules	BCWS	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
	ACWP	283	1	0	0	0	0	1	0	0	0	0	0	0	0	0	284
2.2.5 Mux Boxes & Connectors	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ACWP	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37
2.2.6 Calibration Systems	BCWS	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
	ACWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.2.7 Ass'y & Test Equipment	BCWS	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
	ACWP	139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	139
2.2.8 Factories	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ACWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.2.9 Scintillator Management	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ACWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WBS[2] Totals:	BCWS	144	0	0	0	0	0	0	0	0	0	0	0	0	0	0	144
	ACWP	783	3	4	0	6	0	9	0	0	0	0	0	0	0	0	805
2.3 Electronics, DAQ & Database																	
2.3.1 Near Detector Front End	BCWS	277	0	0	0	0	0	0	8	14	13	15	13	14	72	0	428
	ACWP	402	21	14	0	42	23	23	25	27	21	17	20	16	0	0	652
2.3.2 Far Detector Front-end	BCWS	112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	112
	ACWP	171	0	0	0	0	0	5	0	0	0	0	0	0	0	0	176
2.3.6 Auxilliary Systems	BCWS	88	1	1	1	1	1	1	1	1	0	0	0	0	5	0	102
	ACWP	125	3	4	0	7	5	6	3	3	0	5	3	2	0	0	166

NuMI Other Project Costs - US Funds - Labor Only

($000's Omitted)

Program:	Description:	Approval:
NUMIOPC	NuMI Other Proj Costs	Program Manager
Run Date: 10/16/03	Status Date: 9/30/2003	Functional Manager
		Cost Account Manager

DESCRIPTION		PR YRS	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03	APR03	MAY03	JUN03	JUL03	AUG03	SEP03	FY04	FY05	TOTAL
2.3.7 Electronics Management	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ACWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.3.8 Slow Control & Monitoring	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ACWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.3.9 HV System	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ACWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WBS[2] Totals:	BCWS	477	1	1	1	1	1	1	9	15	14	15	14	15	77	0	643
	ACWP	698	24	18	0	49	28	33	27	30	21	22	23	18	0	0	993
2.4 Far Detector Installation																	
2.4.1 FDI Completed Design Tasks	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ACWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.4.2 FDI Management	BCWS	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	89
	ACWP	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47
2.4.4 FDI Soudan Lab Infrastructure Setup	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ACWP	6	0	0	0	1	0	1	0	0	0	0	0	0	0	0	7
2.4.7 FDI Alignment & Survey	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ACWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WBS[2] Totals:	BCWS	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	89
	ACWP	53	0	0	0	1	0	1	0	0	0	0	0	0	0	0	54
2.5 Near Detector Installation																	
2.5.1 NDI Infrastructure	BCWS	42	4	4	4	4	4	49	20	6	3	10	7	2	204	0	365
	ACWP	41	0	8	0	1	5	3	12	2	3	7	5	14	0	0	101
2.5.2 NDI Plane Assembly	BCWS	226	27	67	11	0	0	171	0	0	0	0	0	0	0	0	501
	ACWP	350	31	21	0	41	2	23	0	0	0	0	0	0	0	0	468
2.5.3 NDI Detector Installation	BCWS	0	0	0	0	0	0	1	1	1	1	1	0	0	733	20	756
	ACWP	0	0	0	0	0	0	7	0	0	0	2	2	1	0	0	11
2.5.4 NDI Facility Experimental Infrastructure	BCWS	0	0	0	0	0	0	0	1	0	4	10	6	6	9	0	37
	ACWP	0	0	0	0	0	0	0	0	0	0	2	15	0	0	0	17
2.5.5 RBI SB&O Experimental Systems Outfitting	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ACWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WBS[2] Totals:	BCWS	268	31	71	15	4	4	220	22	7	8	21	12	9	947	20	1,659
	ACWP	391	31	29	0	42	7	32	12	3	3	11	22	14	0	0	596
2.6 MINOS Project Management																	
2.6.1 FNL-Project Management	BCWS	1,138	22	21	22	22	20	22	21	22	21	22	22	21	0	0	1,398
	ACWP	1,085	9	39	23	17	24	26	21	27	26	13	26	20	0	0	1,356
2.6.2 ANL-Project Management	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ACWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WBS[2] Totals:	BCWS	1,138	22	21	22	22	20	22	21	22	21	22	22	21	0	0	1,398
	ACWP	1,085	9	39	23	17	24	26	21	27	26	13	26	20	0	0	1,356
3.1 NuMI Conceptual Design																	
3.1.1 FNL-BD-NuMI CDR	BCWS	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	99
	ACWP	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	99

NuMI Other Project Costs - US Funds - Labor Only

($000's Omitted)

Program:	Description:	Approval:
NUMIOPC	NuMI Other Proj Costs	Program Manager
Run Date: 10/16/03	Status Date: 9/30/2003	Functional Manager
		Cost Account Manager

DESCRIPTION		PR YRS	OCT02	NOV02	DEC02	JAN03	FEB03	MAR03	APR03	MAY03	JUN03	JUL03	AUG03	SEP03	FY04	FY05	TOTAL
3.1.2 FNL-BD-NuMI FESS CDR	BCWS	112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	112
	ACWP	112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	112
3.1.3 FNL-NuMI Beam Design	BCWS	530	0	0	0	0	0	0	0	0	0	0	0	0	0	0	530
	ACWP	522	0	0	0	0	0	7	0	0	0	0	0	0	0	0	529
3.1.4 FNL-BD-NuMI Project Management	BCWS	132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	132
	ACWP	132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	132
3.1.5 FNL-Soudan Lab Design	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ACWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WBS[2] Totals:	BCWS	872	0	0	0	0	0	0	0	0	0	0	0	0	0	0	872
	ACWP	865	0	0	0	0	0	7	0	0	0	0	0	0	0	0	872
3.2 MINOS Detector R&D																	
3.2.1 FNL-MINOS Scintillator R&D	BCWS	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
	ACWP	2	0	0	0	0	0	5	0	0	0	0	0	0	0	0	6
3.2.2 FNL-MINOS Steel R&D	BCWS	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46
	ACWP	19	0	0	0	0	0	27	0	0	0	0	0	0	0	0	46
3.2.3 FNL-RD-Neutrino Oscillation R&D	BCWS	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
	ACWP	3	0	0	0	0	0	7	0	0	0	0	0	0	0	0	9
WBS[2] Totals:	BCWS	62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62
	ACWP	24	0	0	0	0	0	38	0	0	0	0	0	0	0	0	62
3.4 Soudan/MINOS Operating																	
3.4.1 UMN-Mine Crew Support/Soudan Gen'l Operations	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ACWP	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
3.4.2 UMN-Breitung Township Building Rental	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ACWP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WBS[2] Totals:	BCWS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	ACWP	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Grand Totals:	BCWS	4,568	55	94	39	28	25	244	52	44	44	58	49	45	1,024	20	6,389
	ACWP	5,661	83	99	23	115	60	296	60	62	50	52	72	52	0	0	6,686

NuMI Project Obligations

$000's Omitted

Wk Pkg	WBS #	Inst Code	DESCRIPTION	Amounts as of September 30, 2003 Total Budget	PTD Cost	PO Encumbrances	Requisition Encumbrances	PTD Obligations	Remaining Obligation Authority
YAA	1.1.1.1		EPB/Physics Design Phase	135	137			137	(2)
YAB	1.1.1.2		EPB/Title I & II Design Phase	981	950	47		997	(16)
YAC	1.1.1.3.1		EPB/Title III	83	58			58	25
YAD	1.1.1.3.2.1		EPB/Fabrication	1,359	1,000	46	143	1,189	170
YAE	1.1.1.3.2.2		EPB/Assembly	522	395	0	3	398	124
YAG	1.1.1.3.2.3		EPB/Lambertston Construction	448	402	64		466	(18)
YAH	1.1.1.3.2.4		EPB/Refurbish & Repair B2 Magnets	123	124			124	(1)
YAK	1.1.1.3.2.5		EPB/Refurbish & Repair 3Q120 Magnets	108	83			83	25
YAL	1.1.1.3.2.6		EPB/Fabricate Add'l Trim Magnets	211	338			338	(126)
YAM	1.1.1.3.2.7		EPB/Refurbish 5.5 - 2.87 - 60 Trim Dipoles	20	20			20	0
YAF	1.1.1.3.3		EPB/Installation	370	250	195	9	455	(85)
	1.1.1.3.4		EPB/Precommissioning	0	0			0	0
YAI	1.1.1.4		EPB/Beamline Tests	32	12	2	1	15	16
YAJ	1.1.1.5		EPB/Controls Software & Permit	44	0	2		2	42
YBA	1.1.2.1		NBD/Physics Design Phase	799	781	0		781	19
YBB	1.1.2.2		NBD/Title I & II Design Phase	4,550	4,696	17		4,713	(163)
YBC	1.1.2.3.1		NBD/Title III	49	33			33	15
YBD	1.1.2.3.2		NBD/Construction	2,708	2,270	269		2,539	169
	1.1.2.3.3		NBD/Installation	102	9		28	37	65
	1.1.2.3.4		NBD/Precommissioning	0	0			0	0
YCA	1.1.3.1		PSS/Physics Design Phase	0	0			0	0
YCB	1.1.3.2		PSS/Title I & II Design Phase	1,626	1,624	2		1,626	(0)
YCC	1.1.3.3.1		PSS/Title III	37	29			29	8
YCD	1.1.3.3.2		PSS/Construction & Fabrication	2,322	2,228	138		2,366	(44)
YCE	1.1.3.3.3		PSS/Installation	82	110	28		139	(56)
	1.1.3.3.4		PSS/Precommissioning	0	0			0	0
YDA	1.1.4.1		HDA/Physics Design Phase	60	60			60	0
YDB	1.1.4.2		HDA/Title I & II Design Phase	484	473			473	11
YDC	1.1.4.3.1		HDA/Title III	11	4			4	7
	1.1.4.3.2.1		HDA/Misc Construction Materials	0	0			0	0
YDE	1.1.4.3.2.2		HDA/Absorber Construction	543	121	17		139	405
YDF	1.1.4.3.2.3		HDA/Vacuum Window Construction	25	31			31	(6)
	1.1.4.3.2.4		HDA/Installation	0	0			0	0
YEA	1.1.5.1		NBM/Physics Design Phase	80	80			80	0
YEB	1.1.5.2		NBM/Title I & II Design Phase	307	162	137		299	9

NuMI Project Obligations

$000's Omitted

Wk Pkg	WBS #	Inst Code	DESCRIPTION	Amounts as of September 30, 2003 Total Budget	PTD Cost	PO Encumbrances	Requisition Encumbrances	PTD Obligations	Remaining Obligation Authority
	1.1.5.3.1		NBM/Title III	0	0			0	0
	1.1.5.3.2		NBM/Construction	0	0			0	0
	1.1.5.3.3		NBM/Installation	0	0			0	0
YEF	1.1.5.4		NBM/Downstream Hadron Monitors	97	41	54		95	2
YFA	1.1.6.1		ALS/Physics Design Phase	89	89			89	0
YFB	1.1.6.2		ALS/Title I & II Design Phase	9	9			9	0
YFC	1.1.6.3.1		ALS/Prepare Alignment Documentation	2	2			2	0
YFE	1.1.6.3.3		ALS/Title III	79	80	1		80	(1)
YFF	1.1.6.3.4		ALS/Installation	7	11			11	(4)
YGA	1.1.7.1		WVG/Physics Design Phase	1	1			1	0
YGB	1.1.7.2		WVG/Title I & II Design Phase	466	492			492	(26)
YGC	1.1.7.3.1		WVG/Title III	25	15			15	10
YGD	1.1.7.3.2		WVG/Construction	1,041	862	34	43	939	102
	1.1.7.3.3		WVG/Installation	19	0			0	19
YHA	1.1.8.1		INST/Physics Design Phase	50	50			50	0
YHB	1.1.8.2		INST/Title I & II Design Phase	153	150			150	3
YHC	1.1.8.3.1		INST/Title III	127	158	36		194	(66)
YHD	1.1.8.3.2		INST/Controls, Cables & Safety Systems Construction	200	180	47		226	(26)
YHE	1.1.8.3.3		INST/Controls, Cables & Safety Systems Installation	535	524	43		567	(32)
YHF	1.1.8.3.4		INST/Miscellaneous Installation Activities	75	2	66		67	8
	1.1.8.3.5		INST/Precommission Controls, Cables & Safety Systems		0			0	0
YJA	1.1.9		Hadronic Hose (Close-out)	63	63			63	0
YIA	1.2.1		Facility Const Physics Design Phase	70	70			70	0
YIB	1.2.2		Facility Const Title I Design Phase	1,437	1,437			1,437	0
YIC	1.2.3		Facility Const Title II Design Phase	2,974	2,974			2,974	0
YID	1.2.4.2		Facility Const Title III Services	6,453	6,199	52		6,250	203
YIE	1.2.4.3		Site Preparation & Utilities	1,098	1,093			1,093	5
YIF	1.2.4.4		Underground Work	35,516	35,492	19		35,511	6
YIG	1.2.4.5		Service Buildings & Outfitting	16,792	13,873	2,905		16,778	15
YII	1.2.4.7		FNL Procurements for Conventional Construction	617	406			406	212
YIL	1.2.4.8.1		Facility Const ESH&H	676	668	0		669	7
YIM	1.2.4.8.2		Facility Const FESS Non-Engineering	280	282			282	(2)
YIN	1.2.4.8.3		Facility Const UG Advisory Panel	1,303	1,226			1,226	77
YIO	1.2.4.8.4		Facility Const Miscellaneous	218	203	10	75	288	(70)
YIP	1.2.4.8.5		Facility Const Prebid Document Update	1,056	1,051	5		1,056	(0)
YKA	1.3.1		FY 98 Project Management	141	141			141	0

NuMI Project Obligations

$000's Omitted

Wk Pkg	WBS #	Inst Code	DESCRIPTION	Amounts as of September 30, 2003 Total Budget	PTD Cost	PO Encumbrances	Requisition Encumbrances	PTD Obligations	Remaining Obligation Authority
YKB	1.3.2		FY 99 Project Management	661	661			661	0
YKC	1.3.3		FY00 Project Management	663	663			663	0
YKD	1.3.4		FY01 Project Management	423	423			423	0
YKE	1.3.5		FY02 Project Management	324	324			324	(0)
YKF	1.3.6		FY03 Project Management	428	421			421	7
YKZ	1.3.9		Unallocated Budget	3,596	0			0	3,596
YQF	2.1.1.1	FNL	EDI&A Far Detector Final Design	70	70			70	0
YQG	2.1.1.2	FNL	EDI&A Near Detector Final Design	41	41			41	0
YQA	2.1.1.99	FNL	EDI&A Steel Plane Fabrication	0	0			0	0
YQH	2.1.1.3.1	FNL	EDI&A Oversight	67	67			67	0
YQI	2.1.1.3.2	UMN	EDI&A Oversight	36	36			36	0
YQB	2.1.1.2	FNL	4 Plane Proto Far & Near	79	79			79	0
YQC	2.1.1.3	FNL	Module 1 Steel	1,740	1,740	1		1,740	0
YQD	2.1.1.4	FNL	Module 2 Steel	1,794	1,722	72		1,794	0
YQE	2.1.1.6	FNL	Near Steel	845	845	0		845	0
YQM	2.1.2.1	FNL	EDI&A Steel Handling Fixtures	424	424			424	0
YQN	2.1.2.2	FNL	Far Detector Fixtures	177	177			177	0
YQO	2.1.2.3	FNL	Near Detector Fixtures	192	192			192	0
YQS	2.1.3.1	FNL	EDI&A Near Detector Support Structures	1	1			1	0
	2.1.3.2	FNL	Purchase Near Detector Support Structures	0	0			0	0
	2.1.3.3	FNL	Purchase Near Bookend	0	0			0	0
YQY	2.1.4.1	FNL	EDI&A Magnet Coil	527	527			527	0
YQZ	2.1.4.2	FNL	Coil Materials - Far Detector	329	329	0		329	0
YRA	2.1.4.3	FNL	Coil Materials - Near Detector	76	76			76	0
YRB	2.1.4.4	FNL	Cooling System - Far Detector	5	5			5	0
YRI	2.1.4.5	FNL	Coil Fixtures - Near Detector	32	32			32	0
YRC	2.1.4.6.1	FNL	Instrumentation/Monitoring-Far Detector	142	142			142	0
YRH	2.1.4.6.2	UMN	Instrumentation/Monitoring-Far Detector	63	63			63	0
YRD	2.1.4.6.99	FNL	Instrumentation/Monitoring-Far Detector	0	0			0	0
YRE	2.1.4.7	FNL	Instrumentation/Monitoring-Near Detector	33	33			33	0
YRF	2.1.4.8	FNL	Manufacture Near Coil Parts	302	302			302	0
YRG	2.1.4.9	FNL	Far Coil Prototype	165	165	0		165	0
YRM	2.1.5.1	FNL	EDI&A Detector Plane Prototypes	35	35			35	0
YRN	2.1.5.2	FNL	Far 4 Plane Proto	197	197			197	0
YRO	2.1.5.3	FNL	Far 4 Plane Training School	10	10			10	0
YRP	2.1.5.4	FNL	Materials Handling Prototype	115	115			115	0

NuMI Project Obligations

$000's Omitted

Wk Pkg	WBS #	Inst Code	DESCRIPTION	Amounts as of September 30, 2003 Total Budget	PTD Cost	PO Encumbrances	Requisition Encumbrances	PTD Obligations	Remaining Obligation Authority
YRQ	2.1.5.5	FNL	Near 4 Plane Prototype	138	138			138	0
	2.1.5.6	FNL	Near 4 Plane Training School	0	0			0	0
YRW	2.1.6.1	FNL	Steel Mgmt Travel	57	57			57	0
YSA	2.2.1.1.1	FNL	EDI&A Scintillator Strips	375	375			375	0
YSB	2.2.1.1.2	ANL	EDI&A Scintillator Strips	188	188			188	0
YSC	2.2.1.1.3	UMN	EDI&A Scintillator Strips	16	16			16	0
YSD	2.2.1.1.4	CALT	EDI&A Scintillator Strips	60	60			60	0
YSL	2.2.1.1.6	TUF	EDI&A Scintillator Strips	7	7			7	0
YSP	2.2.1.2.1	ANL	Scintillator Strip Extruding	0	0			0	0
YTB	2.2.1.2.3	FNL	Scintillator Strip Extruding	2,343	2,325	18		2,343	0
YSE	2.2.2.1.2	IU	EDI&A Fiber	91	91			91	0
YSF	2.2.2.1.3	UMN	EDI&A Fiber	32	32			32	0
YSG	2.2.2.1.5	FNL	EDI&A Fiber	99	99			99	0
YSH	2.2.2.1.6	CALT	EDI&A Fiber	86	86			86	0
YSQ	2.2.2.2.1	CALT	Fiber M&S	1,273	1,272	1		1,273	0
YUK	2.2.2.2.2	TAMU	Fiber M&S	123	123			123	0
YST	2.2.2.2.4	IU	Fiber M&S	2,157	2,157			2,157	0
YUN	2.2.2.2.5	JMU	Fiber M&S	103	103			103	0
YSJ	2.2.3.1.1	UMN	EDI&A Module Design & Prototyping	305	302	3		305	0
YSI	2.2.3.1.2	ANL	EDI&A Module Design & Prototyping	46	46			46	0
YSK	2.2.3.1.3	FNL	EDI&A Module Design & Prototyping	153	153			153	0
	2.2.3.1.4	IU	EDI&A Module Design & Prototyping	0	0			0	0
YSM	2.2.3.1.5	CALT	EDI&A Module Design & Prototyping	9	9			9	0
YSN	2.2.3.1.6	TUF	EDI&A Module Design & Prototyping	4	4			4	0
YUO	2.2.3.2	UMN	Scintillator Module Parts - Near Detector	54	54	0		54	0
YSW	2.2.3.3.1	FNL	Scintillator Module Parts - Far Detector	1,104	1,080	24		1,104	0
YTF	2.2.3.3.2	TUF	Scintillator Module Parts - Far Detector	74	74			74	0
YUS	2.2.3.4	FNL	Scintillator Module Parts	261	261			261	0
YSO	2.2.4.1.2	TXA	EDI&A Photodetector Systems	124	124			124	0
YSX	2.2.4.2.1	TXA	Photodetectors	1,355	1,355			1,355	0
YUL	2.2.4.2.3	ATH	Photodetectors	23	23			23	0
YSY	2.2.4.3.1	TXA	PMT Bases and Mounting for SM1	200	200			200	0
YUP	2.2.4.3.2	UCL	PMT Bases and Mounting for SM2	0	0			0	0
YSU	2.2.5.1.2	IU	EDI&A Mux Boxes & Connectors	89	89			89	0
YSV	2.2.5.1.4	FNL	EDI&A Mux Boxes & Connectors	46	46			46	0
YSZ	2.2.5.1.5	IU	QC LED Computer System	31	31			31	0

NuMI Project Obligations

$000's Omitted

Wk Pkg	WBS #	Inst Code	DESCRIPTION	Amounts as of September 30, 2003 Total Budget	PTD Cost	PO Encumbrances	Requisition Encumbrances	PTD Obligations	Remaining Obligation Authority
YSR	2.2.5.2.1	IU	Connectors	159	159			159	0
YUM	2.2.5.2.3	FNL	Connectors	11	10	0		11	0
YWJ	2.2.5.2.4	FNL	Connectors - Rework	30	30			30	0
YSS	2.2.5.3.1	IU	Mux Boxes	447	447			447	0
YUQ	2.2.5.3.2	TUF	Mux Boxes	225	225			225	0
YUG	2.2.5.3.4	TXA	Mux Boxes	56	56			56	0
YTA	2.2.6.1.1	FNL	EDI&A Calibration Systems	0	0			0	0
	2.2.6.3.1	FNL	Light Injection System - Near Detector	0	0			0	0
YTK	2.2.7.1.1	ANL	EDI&A Ass'y & Test Equipment	243	243			243	0
YTJ	2.2.7.1.2	FNL	EDI&A Ass'y & Test Equipment	35	35			35	0
YTN	2.2.7.1.3	UMN	EDI&A Ass'y & Test Equipment	47	47			47	0
YTM	2.2.7.2.1.1	ANL	Prototype Factory Equip Purch/Fabr	255	255			255	0
YTO	2.2.7.2.1.2	UMN	Prototype Factory Equip Purch/Fabr	22	22			22	0
YTL	2.2.7.2.1.3	FNL	Prototype Factory Equip Purch/Fabr	152	152			152	0
YTP	2.2.7.2.2.1	ANL	Factory 1 Equip Purch/Fabr	217	217			217	0
YTI	2.2.7.2.2.2	CALT	Factory 1 Equip Purch/Fabr	103	103			103	0
YTQ	2.2.7.2.2.3	FNL	Factory 1 Equip Purch/Fabr	25	25			25	0
YTC	2.2.7.2.2.4	UMN	Factory 1 Equip Purch/Fabr	57	57			57	0
YTG	2.2.7.2.3.1	ANL	Factory 2 Equip Purch/Fabr	307	307			307	0
	2.2.7.2.3.2	FNL	Factory 2 Equip Purch/Fabr	0	0			0	0
YTD	2.2.7.2.3.3	UMN	Factory 2 Equip Purch/Fabr	165	165	0		165	0
YUT	2.2.7.2.4.1	ANL	Equip for Soudan Purch/Fabr	31	31			31	0
	2.2.7.2.4.2	FNL	Equip for Soudan Purch/Fabr	0	0			0	0
YUH	2.2.7.2.4.3	UMN	Equip for Soudan Purch/Fabr	0	0			0	0
	2.2.7.2.5.1	FNL	Near Detector Site Equip Purch/Fabr	0	0			0	0
YTE	2.2.7.2.6.1	ANL	Other Equipment	61	61			61	0
YUI	2.2.7.2.6.3	UMN	Other Equipment	0	0			0	0
YTT	2.2.8.1	ANL	EDI&A Factories	28	28			28	0
YTR	2.2.8.2	CALT	Factories Ass'y Line Outfitting 1	164	164			164	0
YTS	2.2.8.3	UMN	Factories Ass'y Line Outfitting 2	172	172			172	0
YTU	2.2.8.4.1	CALT	Module Production	1,251	1,251			1,251	0
YUU	2.2.8.4.2	UMN	Module Production	1,164	1,164	0		1,164	0
YUV	2.2.8.4.3	ANL	Near Detector Production	500	500			500	0
YTW	2.2.9.1.1	FNL	Scintillator Mgmt Salaries	3	3			3	0
YTV	2.2.9.1.2	ANL	Scintillator Mgmt Salaries	101	101			101	0
YTX	2.2.9.1.3	UMN	Scintillator Mgmt Salaries	60	60			60	0

NuMI Project Obligations

$000's Omitted

Wk Pkg	WBS #	Inst Code	DESCRIPTION	Amounts as of September 30, 2003 Total Budget	PTD Cost	PO Encumbrances	Requisition Encumbrances	PTD Obligations	Remaining Obligation Authority
YUJ	2.2.9.2.1	FNL	Scintillator Mgmt Travel	0	0			0	0
YTH	2.2.9.2.2	ANL	Scintillator Mgmt Travel	27	27			27	0
YTZ	2.2.9.2.3	CALT	Scintillator Mgmt Travel	149	149	0		149	0
YTY	2.2.9.2.4	UMN	Scintillator Mgmt Travel (Paid by FNL)	39	39			39	0
YUA	2.3.1.1.1	ANL	EDI&A Near Detector Front End	897	897			897	0
YUB	2.3.1.1.2	FNL	EDI&A Near Detector Front End	567	567	0		567	0
YWF	2.3.1.1.3	IIT	EDI&A Near Detector Front End	96	96			96	0
YUW	2.3.1.2.1	ANL	Parts Order and Assembly NDFE	513	462	51		513	0
YUD	2.3.1.2.2	FNL	Parts Order and Assembly NDFE	2,122	2,117	6		2,122	0
YWG	2.3.1.3.1	ANL	Production Checkout NDFE	123	0	123		123	0
YWH	2.3.1.3.2	FNL	Production Checkout NDFE	36	36			36	0
YWI	2.3.1.4	ANL	Installation NDFE	0	0			0	0
YUC	2.3.2.1.2	HVD	EDIA Far Detector Front End	351	351			351	0
YUE	2.3.2.1.3	FNL	EDIA Far Detector Front End	121	121			121	0
YUX	2.3.2.2.2	HVD	Parts Order and Assembly FDFE	399	399			399	0
YUF	2.3.2.2.3	FNL	Parts Order and Assembly FDFE	297	297			297	0
YUY	2.3.2.3.1	HVD	Production Checkout FDFE	29	29			29	0
	2.3.2.3.2	FNL	Production Checkout FDFE	0	0			0	0
	2.3.2.4.1	ANL	Installation FDFE	0	0			0	0
YVM	2.3.5.1	UMN	EDIA Database	0	0			0	0
YVN	2.3.5.2	UMN	Database Purchase & Programming	10	10	0		10	0
YUZ	2.3.6.2.2	FNL	Clock Distribution System	224	224	0		224	0
YVT	2.3.6.4	IIT	Auxiliary Systems	24	24			24	0
YVV	2.3.7.1	ANL	Electronics Mgmt Travel	47	47			47	0
YVA	2.3.7.2	ANL	NDFE Electronics Level 3 Manager	171	137	34		171	0
YVX	2.3.8.2.1	FNL	Procurement and Assembly	36	36			36	0
YVY	2.3.8.2.2	UMN	Procurement and Assembly	360	337	23		360	0
YVZ	2.3.9.3	TAMU	HV System	4	4			4	0
YWD	2.3.9.4	FNL	HV System	73	73			73	0
	2.4.1.1	SDN	FDI Completed Design Tasks	0	0			0	0
YWB	2.4.1.1.2	FNL	EDI&A FDI Infrastucture	0	0			0	0
	2.4.1.2	FNL	FDI Soudan Completed Design Tasks	0	0			0	0
YVB	2.4.2.1	SDN	FDI Minecrew Management	301	300	0		301	0
YVK	2.4.2.2	FNL	FDI Minecrew Management	233	227	6		233	0
YVU	2.4.2.4	TAMU	FDI Minecrew Management	49	49			49	0
YVC	2.4.3	SDN	FDI MINOS Construction Oversight	115	115			115	0

NuMI Project Obligations

$000's Omitted

Wk Pkg	WBS #	Inst Code	DESCRIPTION	Amounts as of September 30, 2003 Total Budget	PTD Cost	PO Encumbrances	Requisition Encumbrances	PTD Obligations	Remaining Obligation Authority
YVD	2.4.4.1	SDN	FDI Soudan Lab Infrastructure Setup	452	451	2		452	0
YWC	2.4.4.2	FNL	FDI Soudan Lab Infrastructure Setup	22	22			22	0
YVE	2.4.5	SDN	FDI Labor Costs	2,959	2,759	200		2,959	0
YVF	2.4.6	SDN	FDI DNR Costs	378	378	0		378	0
YVG	2.4.7.1	SDN	FDI Purchases & Setup	0	0			0	0
YVI	2.4.7.2	FNL	FDI Alignment & Survey	69	67	1		69	0
YXA	2.5.1.1	FNL	NDI Infrastrucure EDI&A	47	47			47	0
YVL	2.5.1.2.1	FNL	NDI Install Support Structure	(0)	(0)			(0)	0
YVO	2.5.1.2.2	FNL	NDI Install Racks	116	116			116	0
	2.5.1.2.3	FNL	NDI NHI Install LCW System	9	7	1		9	0
YVP	2.5.1.2.6	FNL	NDI Install Coil Power Supply	0	0			0	0
YWE	2.5.2.1.2	IIT	NDI Plane Assembly EDI&A	10	10			10	0
YVJ	2.5.2.2	FNL	NDI New Muon Assembly Area Setup	161	161			161	0
YVW	2.5.2.3	FNL	NDI Assembly of Detector Planes-One Shift	342	342			342	0
	2.5.3.1	FNL	NDI Detector Installation EDI&A	2	2			2	0
	2.5.3.2	FNL	NDI Hall Tech Area Setup	155	7		148	155	0
	2.5.3.3	FNL	NDI Spectrometer Plane Installation	0	0			0	0
	2.5.3.4	FNL	NDI Calorimeter Plane Installation	0	0			0	0
YVR	2.5.3.5	FNL	NDI Detector Electronics Installation	31	31			31	0
YVS	2.5.3.6	FNL	NDI Magnet Coil Installation	0	0			0	0
	2.5.4		NDI Facility Experimental Infrastructure	131	124	3	4	131	0
YWL	2.5.5	RBI	NDI SB&O Experimental Systems Outfitting	2,590	1,957	632		2,590	0
YYA	2.6.1	FNL	Project Management	1,505	1,505			1,505	0
YYB	2.6.2	ANL	Project Management	98	98			98	0
YZA	3.1.1	FNL	BD-NuMI CDR	487	487			487	0
YZB	3.1.2	FNL	BD-NuMI FESS CDR	346	346			346	0
YZC	3.1.3.1	FNL	BD-NuMI Beam (FNAL)	555	555			555	0
YZD	3.1.3.2	FNL	BD-NuMI Beam E&D (IHEP)	241	241			241	0
YZE	3.1.4	FNL	BD-NuMI Project Management	234	234			234	0
YZV	3.1.5	FNL	NuMI-Soudan Lab CDR	65	65			65	0
YZF	3.2.1	FNL	MINOS Scintillator R&D	988	988			988	0
YZG	3.2.2	FNL	MINOS Steel R&D	644	644			644	0
YZH	3.2.3	FNL	RD-Neutrino Oscillation R&D	136	136			136	0
	3.3	SDN-CONST	MINOS Cavern	10,769	0	10,769		10,769	0
YZU	3.4.1	SDN-OPER	NuMI-Mine Crew Support/Soudan Gen'l Operations	1,531	1,531	0		1,531	0
YZX	3.4.2	SDN-OPER	NuMI-Breitung Township Building Rental	76	75	0		76	0

NuMI Project Obligations

$000's Omitted

Wk Pkg	WBS #	Inst Code	DESCRIPTION	Amounts as of September 30, 2003 Total Budget	PTD Cost	PO Encumbrances	Requisition Encumbrances	PTD Obligations	Remaining Obligation Authority
YZW	3.4.3	SDN-OPER	NuMI-E Peterson Salary	72	71	1		72	0
			Totals	**153,239**	**131,942**	**16,206**	**455**	**148,604**	**4,635**